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IN HEALTH AND DISEASE

BY

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MIND IN THE LOWER ANIMALS:

IN ITS ABNORMAL MANIFESTATIONS.

PRELIMINARY ENQUIRIES.

CHAPTER I.

MENTAL PHENOMENA IN ACEPHALOUS ANIMALS.

THE student of comparative psychology cannot too soon divest himself of the erroneous popular idea that *brain* and mind are in a sense synonymous; that brain is the *sole organ* of the mind; that mind cannot exist *without brain*; or that there is any necessary relation between the size, form, or weight of the brain and the degree of mental development. Even in man there is no necessary relation between the size, form, or weight of the brain and the degree of mental development; while the phenomena of disease in him show to what extent lesions of cerebral substance occur without materially affecting the mental life.

Physiologists are gradually adopting or forming a more and more comprehensive conception of mind, and are coming to regard it as a function or attribute not of any particular organ or part of the body, but of the body as a whole. Long ago the illustrious Milton, discoursing of mind and its seat, properly described the human mind as an attribute of man's body as a whole. In various forms or words this view has been expressed in recent times by Müller, Lewes, Laycock, Bushnan, Bastian, Maudsley, Carpenter, and others. According to these authors the seat of mind is throughout the body (Müller); mind pervades the body (Laycock and

Bushnan); mind comprehends the bodily life (Maudsley); psychical life has no one especial centre (Lewes); the whole nervous system is the seat or organ of mind, the brain being only its chief seat or organ (Bastian). The brain, then, is only *one* organ of mind—the organ, it may be said, only of special mental functions.

The old doctrine or assumption of the phrenologists, as represented by Gall and Combe, the doctrine on which they have so greatly prided themselves, and foolishly continue to do so—that, namely, which regards the brain as the sole organ of the mind—must unquestionably be given up.

We must henceforth regard the true site, seat, or organ of mind as *the whole body*; and this is the only sound basis on which the comparative psychologist can begin his studies. There would be the less difficulty in accepting such a basis were it only borne in view that the *muscular* as well as the nervous system, that muscular action, has an intimate relation to mental phenomena—to ideas as well as feelings. Muscular action is essential in certain, if not in all, mental processes—e.g. in feeling or emotion. Outward muscular expression (e.g. facial) and inward ideas or feelings are inseparably correlated (Maudsley).

Further, certain phenomena generally referred in man to mind are exhibited where *no brain* exists, where it never has existed, or where it has been removed or destroyed—artificially or by disease. There is no brain proper in the Hymenoptera, certain authors think, and yet its equivalent or analogue executes what in man would be set down as intellectual actions (Houzeau). Darwin points out the wonderful difference in *size* between what he regards as the brain of the ant and that of man; and yet, in many respects, that active, intelligent little insect is man's mental superior.

But, in order to understand the nature and variety of the mental phenomena that are compatible with the absence of brain in the highest animals, there is no more important subject of study than the actions of headless and brainless infants and animals. The following must here suffice as illustrations:—

1. In what is known to physiologists as Goltz's croaking

experiment (*Quakversuch*) in the frog, after the cerebral hemispheres have been removed, gentle stroking of certain parts of the body, by means of the finger or any broad smooth surface, produces a croak of satisfaction, 'once at each stroke, with machinelike regularity;' but if the animals are 'touched or stroked with a sharp instrument, they do not croak, but execute defensive movements. . . . When any nerve-trunk is irritated they sometimes utter a sound indeed, but it is the cry of pain and never the croak of contentment' (Brunton).

2. According to Magendie, Longet, Flourens, and Schiff, a pigeon with its cerebral hemispheres removed, if thrown into the air, flies; if laid prone, gets up; shuts its eyes in a bright light; preens its ruffled feathers; follows with its head the movements of a candle; stands on one leg and then changes to the other, maintaining its balance or equilibrium; shakes its head and puts it under its wing for sleep—in other words, it receives and responds to certain kinds of external as well as internal impressions.

3. In Ppflüger's well-known vinegar experiment on decapitated frogs, if a drop of acetic acid be applied to one thigh the animal wipes it off, or endeavours to do so, with the opposite foot or leg; the animal, in short, makes experimental efforts to expunge the irritant, while its legs also 'make efforts to push away the probe with which its cloaca is being irritated' (Carpenter).

4. Suction of the mother's teats by the brainless puppy (Grainger).

5. The decapitated salamander swims (Dumeril).

6. The brainless rat, if a sharp noise be made, bounds away as if alarmed (Vulpian).

7. The anencephalic infant not only moves its limbs, but sucks and cries.

Similar actions are performed by animals that have been not only decapitated, but dismembered or cut into sections. Thus the segments of a myriapod walk—the capital segment avoiding obstacles—in the absence of vision (Houzeau).

Now, these actions involve the following phenomena:—

1. Definite purpose or design, end or aim; purposive action, adaptive or adapted movements, adaptation of means to ends; actions directed to the well-being of the individual, including self-preservation and self-defence.

2. Variety of action with variety of circumstance.

3. Spontaneity of action.

4. Choice.

5. Repetition of effort, involving experiment or trial, and ultimate success or failure.

6. Avoidance of obstacles.

7. Perception.

8. Co-ordination.

9. Pleasure, pain, and certain of their modes of expression.

By almost common consent of physiologists these phenomena, when exhibited in brainless animals, are assigned to the category of what are variously called *reflex*, automatic, mechanical, excito-motor, or sensori-motor actions, which are supposed to be independent of, or unassociated with, intelligence, memory, reason, sensation, consciousness, and will; but it appears to me that this assignation has been altogether, or at least too much, determined by the fact that the brain is absent, and that consciousness and volition are supposed to depend upon the existence of a brain. On the contrary, I hold that both consciousness and volition, in some form or degree, are exhibited not only by animals deprived or destitute of brain, but even of a nervous system, as well as by certain plants, as I have elsewhere shown. Unless we make this concession—adopt this view of the comprehensive character of consciousness and will—it is obvious that mental philosophers must so re-define these terms as to restrict their application to animals provided with a brain and spinal cord; and any such re-definition will probably be difficult, mischievous, and unscientific.

Lewes and Carpenter at least appear to support the view that *consciousness* is by no means limited to cerebral action, nor dependent on the presence of a brain. Lewes affirms that the absence of brain does not necessarily imply the ab-

sence of all consciousness, that consciousness is only mainly dependent on brain, and that there are other centres of sensation and volition than the brain. Carpenter also points out that consciousness remains after removal of the cerebrum, and that sensations and sensori-motor actions occur independently of it. There are other authors who regard consciousness as a property of all nervous matter.

In connection with the important subjects of consciousness and volition the student cannot give too close and early attention to—

1. The functions of the *spinal cord* in man and other animals. While some authors believe it to possess purely reflex functions only, others are of opinion that its functions include sensation and volition (Maudsley).

2. The phenomena of *primary and secondary* automatic mental action in man; the transition of consciousness into unconsciousness; the effects of habit and repetition on mental action. *Primary* automatic mental action in man and other animals is that which is simply reflex *ab initio*; while *secondary* mechanical mental action is that which, at first the result of intelligence, consciousness and will, becomes in course of time, by the repetition of action, practice or habit, unconscious and involuntary, or at least non-voluntary. The whole subject of *unconscious cerebration* in man (Carpenter), unconsciousness in mind (Holmes), and unconscious memory (Maudsley), is pregnant with interest.

3. The *essential* constituents, or nature, and the range, of intelligence, consciousness, and volition.

Some physiologists draw what must be regarded as untenable and artificial distinctions between reality and *resemblance* in conscious and unconscious mental action. They suggest, if they do not assert, that purposive actions may possess a false appearance of ideation, a deceptive volition; that they may be merely apparently purposive or adapted; that they are—seemingly only—directed by will and accompanied by consciousness—volition, consciousness, design or intention being all in reality absent. They refer only to *apparent* design in headless animals, and to reflex action,

what they would not question appertains to conscious, intelligent design in man, or in other animals possessed of a brain. It cannot be maintained that they are here in error; but it is at least probable that they frequently confound reality and resemblance, mistaking the real for the apparent, or *vice versâ*, and that they allow themselves to be misled in their inferences by the mere *presence or absence of a brain* or nervous system.

CHAPTER II.

DEFECT, DISORDER, AND DEGENERACY OF MIND IN MAN.

Mental Condition of Idiots, Lunatics, and Criminals.

It is not enough for the student of comparative psychology to be acquainted with the phenomena of *undeveloped mind* as it is illustrated in the human infant or savage adult. Not less interesting and important, as a standard of comparison with the psychical condition of the lower animals, are the phenomena of—

1. Mental defect, non-development or absence of mind, in the human *idiot.*

2. Arrested development in the human *imbecile.*

3. The mental decay of *senility* in man.

4. The *degeneration* or degradation of mind, on the one hand, (*a*) in the civilised European, for instance, in the Portuguese settlers in Malacca; and on the other, (*b*) in savage races, such as the Australian aborigines, under the influence of prostitution, drink and disease, introduced by the 'civilised' whites.

5. The various perversions, disorders, or *diseases* of mind that constitute human insanity; as well as

6. So-called *reversions* to the animal type in wild men and beast children, including the *bestial*, theroid or feral habits of certain human idiots and lunatics.

In the human *idiot* the following mental peculiarities and bodily concomitants, which have been fully described by Professor Duncan, Dr. Browne, Dr. Ireland and others, are specially deserving of note:—

1. *Defective mentalisation*, intellect and morals, with their results—stupidity and helplessness. The defect sometimes

extends to the apparent absence of all intellect or intelligence. In a case of this kind, whose picture was drawn by Hugh Miller, he noticed, nevertheless, the existence of a few instincts, affections or emotions, such as love, compassion, sorrow or grief, recognition of kindness, astonishment and terror, associated with taciturnity, melancholy, and non-realisation of the nature of death. Ireland speaks of the 'passive intellect' of idiots, and describes their incapability of inference, and their want of memory.

The lowest class of idiots exhibit 'nothing beyond *reflex* movement, known as *excito-motor*' (Bucknill and Tuke). They have no power of 'perceiving, grouping, comparing, separating, recalling their *experiences*' (Browne).

2. *Non-improvability*: incapacity for intellectual or moral development.

3. No power of *generalisation*: no formation of abstract ideas (Ireland).

4. 'No knowledge of *religious* truth' (Browne).

5. No instinct of *self-preservation* (Browne).

6. No knowledge of the value of *money* (Browne).

7. No propensity to acquire *property* (Browne).

8. 'No spontaneity' (Browne).

9. No *fear*, in some cases (Browne).

10. The predominance of *instinct* over reason, or rather the presence of instinct, or of certain instincts, in the absence of reason (Hitchman).

11. The dominance, also, of what are improperly called the 'animal' propensities—the lower *passions and appetites*, including the venting of rage on inanimate objects or obstacles (Browne), and general irritability of temper.

12. Absence of the *moral sense* (Browne), incapability of understanding right and wrong. Appreciation, however, of rewards and punishments, while uninfluenced by higher motives.

13. *Irresponsibility*—partial or total.

14. *Criminal* propensities, especially to theft.

15. *Destructiveness* and mischievousness.

16. The power of *imitation*, senseless or unreflecting, as illustrated, for instance, by 'following the lead,' as sheep

do, even into obvious danger; or by results as serious or as dangerous as those which so frequently characterise the imitative pranks of the monkey (Browne).

17. Defects or perversions of the special *senses* or of *sensation*, especially of hearing, vision, smell and taste. Idiots scarcely possess the sense or sensation of *taste*; only some of them can distinguish *colours* (Ireland). There is equal *non-appreciation* of shape or *form*.

18. They have no notion of the qualities of external bodies (Browne).

19. There is no sense or estimation of *time* or *distance*.

20. Nor is there any idea of *order*.

21. Their many physiological or pathological anomalies include perversion of *cutaneous sensibility*.

22. Defective *muscular co-ordination*, as applied, for instance, to the use of the fingers or legs; imperfections, therefore, in locomotive power or motility (Duncan), and uselessness or awkwardness with the fingers or hands. In some there is utter incapability of using the *hands* (Ireland).

23. Accompanying physical or bodily deformities, defects, or disorders, including epilepsy and chorea, with *goitre*, constituting *cretinism*.

24. Use of the *teeth* for vicious biting.

25. *Filthy habits* of person, inattention to cleanliness or the calls of nature.

26. Peculiarities as to *food* consumption. Some of them 'eat and drink like beasts,' tearing raw flesh and lapping water; they bolt their food and gorge themselves as certain carnivora do.

27. *Morbid appetite*: eating of fæces, ordure or dung—technically known as coprophagy (Lombroso and Ireland).

28. Preference for *animal* society: the acquisition of animal language, sufficient to enable them to hold intercourse with their animal companions. Dr. Browne, for instance, mentions the fondness of Swiss cretins for cats, and cites Kund, 'the cat's Raphael,' as an apt illustration.

So close and striking is the resemblance in general habits between certain microcephalic or other human *idiots* and some of the lower animals, that these idiots have been dis-

tinctively called generally animal, brute-like, theroid or feral —and specifically, according to the nature of the individual resemblance, pithecoid, simian or ape-like, rabbit-like, cow-like, sheep-like, and so forth. The Aztecs some years ago exhibited in this country were good examples of microcephalic ape-like idiots. A microcephalic idiot, who died in the hospital at Cremona, was known, from the peculiarity of his habits, as the 'bird-man.' 'He leaped on one leg, and, before putting himself in motion, he stretched out his two arms like wings. He used to hide his head under his armpit, and chirped strongly when frightened or at the sight of a stranger. He was said to be wanting in touch, taste, and smell; was dirty in his habits, and given to coprophagy.' A paralytic, also Italian, idiot, was known as the 'rabbit-man,' or the 'man-rabbit,' from his habit of moving the nose and lips, from being timid, and fond of green vegetables, such as salad and cabbage. 'When he is frightened, he stamps with his feet as rabbits do.' A third Italian idiot, known as the 'monkey,' 'leaps with the spine bent, and hands before him, like an ape.' . . . . 'He stoops in walking like a tamed monkey, while a brother of his rolls his eyes quickly like a monkey, and touches everything with the hand' (Lombroso and Ireland). In other words, in these two cases the general appearance and gestures, the external or physical characters, are of a sufficiently marked pithecoid or simian type to impress common and casual observers.

Professor Maudsley has narrated the case of a microcephalic idiot who 'resembled a goose in many things, and had the *cutis anserina*;' while Pinel has described another who assumed the habits of a sheep (Ireland). In certain of these cases it has been stated that the idiots had had no opportunity of ever seeing the animals whose habits they nevertheless had so correctly imitated. If such was the fact, their assumption of the habits of lower animals was all the more significant.

Of all classes of human idiots there is none more interesting to the student of comparative psychology than that which includes *wild men* and *beast children*,—such adults as

Victor, the savage of the Aveyron, and such children as Peter, the wild boy of Hanover, and the so-called *wolf-children* of India. As regards the latter, it matters not at all, for our present purpose, whether or not they were really nourished or protected by wolves. That is a question belonging to the subject of *foster-parentage*. At present our concern is simply with their *animal habits*. Though doubts have been thrown upon the character of their up-bringing, it seems to be generally conceded by trustworthy authorities, including Professor Max Müller, Professor Seeley, Colonel Sleeman, and the Rev. Mr. Gerhardt, that these wolf-children were really or virtually *juvenile idiots*, running wild in the Indian jungle, living the life, and assuming the habits of, if they did not also associate with, wolves or other wild forest animals. Their peculiarities of habit and life included the following:—

1. The quadrupedal practice of going on *all fours*, common to the savage of Aveyron and other wild men or children. This involves the use of the arms and hands as *forelegs and paws*. 'The facility with which they get along on four feet' (hands and feet in reality) 'is surprising' (Gerhardt).

2. The squirrel-like habit of *climbing trees*, as in the well-known cases of Peter of Hanover and Victor of Aveyron.

3. *Nocturnal prowling*, with hiding in solitary places and sleeping by day.

4. *Lapping*, or sucking *water*, like the ox, horse or dog, as exhibited by the savage of Aveyron.

5. Ravenously tearing up and eating *raw flesh* even of living animals; and the devouring of offal, with the gathering and *gnawing of bones*, as well as catching and swallowing flies like a dog (Browne). *Cannibalism* is included also in this form of feral appetite.

6. The use, as food, of *raw fruits* or seeds, such as acorns; of roots, bark, leaves, grass, and various vegetables, again as illustrated in the cases of Peter and Victor.

7. The *smelling* of all food before eating it, as in the case of Peter of the Hanoverian woods.

8. Ferocious *biting*. A boy found in company with a

female wolf and her cubs, in India, 'tried to fly at children and bite them' (Gerhardt).

9. Absence of *clothing*, and repugnance to its use.

10. Absence of spoken *language*; no understanding of man's language; nocturnal howling, yelling and whining. Hanoverian Peter 'uttered no sound,' while Victor's 'voice was imperfect and guttural. He could not articulate, but uttered a monotonous sound' (Browne).

11. Insensibility to kindness.

12. Absence of *joy* and its signs, no *smiles* nor smiling.

13. Want of *shame*.

14. No fixed or proper *dwelling*, and incapability of constructing any sort of *shelter* for the person.

15. *Incapacity for education* or instruction, for mental progress beyond that possible in the case of other idiots (Brodie).

The training of Peter, the wild boy of Hanover, was attempted by Dr. Arbuthnot in 1724, at the instance of George I. But the lad was found to be a deaf-mute idiot, incapable of education. 'He could not be taught to perform the simplest manual act without superintendence' (Browne). Again an effort at the instruction of Victor of Aveyron was made by Itard. But Victor, too, was proved by Pinel to be an idiot, and was treated as such by confinement in a Parisian lunatic asylum. 'Although acquiring a knowledge of certain conventional signs, and of the mode of performing a few simple duties, he continued to display the chief characteristics of his original animal existence' after all the tuitional pains expended upon him (Browne).

One of a couple of wolf-children of Oude (India)—described by Professor Seeley—died in the midst of Anglo-Indian civilisation, in what to the poor boy himself was too obviously an irksome captivity. His habits in the woods had been those of a wolf, and notwithstanding all the efforts at his reformation, he died as he had lived—a 'lower' animal. But in the second case, there was a certain degree of humanisation, though the process of improvement was very slow and difficult. The *whine* was in course of time exchanged for expressions of pleasure and gratitude; and some other habit-changes resulted, of a kind comparable to

those that occur in ordinary European idiot children in our idiot asylums.

Animal-like idiots with quadrupedal habits were sufficiently well known even in the time of Linnæus 'to justify him in his curious identification of such individuals as additional *species* of the genus *homo*.' He enumerates no less than eleven such *species*, which included wild or wood boys or girls found, or said to have been found, among wolves, bears, wild sheep and oxen (Browne).

Many comparisons have been drawn—unfavourable to the human idiot—between his mental condition and that of the dog, horse, and other animals. Thus Dr. Browne points out the *mental inferiority* of the cretin to the horse, as illustrated by the one going round, the other stepping over, small obstacles. Dr. Bucknill shows the psychical inferiority of British idiots to the dog or horse; and Dr. Hitchman their resemblance, both physical and mental, to the anthropoid apes. Hugh Miller drew a comparison between an idiot—not by any means of the worst type—and the dog—the contrast being unfavourable to the idiot. Maudsley, too, regards human idiots as inferior in intelligence to certain of the lower animals. And indeed there can be no doubt of the fact that intellectually and morally the human idiot is far below many of the so-called 'lower' animals.

Among the occasional phenomena of *human insanity*, even in the most highly civilised peoples, is the *delusion* that the individual has been transformed into this or that other animal, in which case the habits of the particular animal are assumed and imitated with wonderful, and frequently dangerous, fidelity. Sometimes, moreover, such delusions have become *epidemic*, affecting large bodies of people. Thus one of the most noteworthy of the epidemics of the middle ages was the singular *were-wolf*-madness, technically known as *lycanthropia*. The human 'were-wolf,'—the *loup-garou* of France—was common in the Jura about the years 1590 to 1600. This wolf-madness was simply an imitative form of *delusional insanity*, which led its victims to betake themselves to the woods, and to adopt all the savage habits of the wolf, including *cannibalism*. A minority of such delusionists

believed themselves to be *dogs*, (*cynanthropia*), goats, or other animals; and their assumed morbid habits were correspondingly various.

The other *bestial phenomena of human insanity* resemble those of human idiocy, including, for instance—

1. In certain cases, the absence of all *moral sense*; utter incapability of distinguishing or appreciating right and wrong.

2. Loss of *self-control*, incapability of regulating the will, absence, real or apparent, of all volition.

3. Absence of *decency*, modesty, chastity, with a propensity to debauchery.

4. Dislike to *clothing*, and propensity to denude the person thereof. Many insane patients in our lunatic asylums—especially those in a state of acute mania—insist on being in a state of *nudity*. In some, running naked through the streets of towns, or on country roads—nudity as an offence against public decency—is not unfrequently the symptom that first attracts the attention of the public authorities to the fact of a man's insanity, and leads to his being placed under proper treatment. In January 1876, for instance, a young man in a state of mania from drink presented himself at my own door, absolutely naked, after running wildly up and down the road leading past my house. He had stripped himself and left his clothes in a heap on the roadside, but when he rang my bell and presented himself before me, he was utterly unaware that he was not in proper visiting costume.

5. *Criminal* impulse, for instance, to theft and homicide.

6. *Cruelty* to each other, to the extent of serious mutilation of the person.

7. *Filthy* habits, such as ordure-smearing, or indifference to personal cleanliness and the calls of nature.

8. *Morbid appetite*, including ordure-eating, the mastication of grass and all kinds of leaves, swallowing all sorts of iron-ware, such as needles, pins, and nails. I have myself had insane patients who have swallowed indiscriminately poultices, and poultice-clothes, letters, needles, and other metallic or fibrous indigestible and highly unsavoury substances. The materials I have collected on this subject of

morbid appetite, in man and other animals, are sufficient in amount and importance, however, to require a special chapter.

9. *Rumination.* Houzeau speaks of 'ruminant' men, and I have myself had grass-eating human ruminators among my hospital patients.

10. *Imitative* impulse, but to a less extent usually than in the idiot. Imitations of animal characteristics include lowing like the ox, crowing like the cock, barking and biting like the dog, and so on.

Bestial traits are developed also in certain human diseases that do not belong to the category of insanity, though it is really as phenomena of a secondary insanity that the said animal peculiarities show themselves. This *secondary* insanity might indeed well be called distinctively the bestial, feral or theroid insanity, for instance, of hydrophobia. Thus in human *hydrophobia*, especially in those *spurious* forms thereof that are more common than the real ones, that are produced by, and probably consist of, morbid imagination acting on a hyper-sensitive nervous system—the victim who believes that he has been bitten by a rabid *dog*, and so has had his whole constitution impregnated with canine proclivities, barks, snaps, and bites like a dog; while if he thinks a rabid *cat* has been the instrument of his torture, he mews, hisses and scratches.

There are certain cases, moreover, in which there is no proof of the presence of *disease*—mental or nervous—in which, nevertheless, animal habits have been developed, for instance in the case of the hermits of Mesopotamia mentioned by Houzeau, who went on all fours, emitted cries, and herded with cattle. The presumption is, however, that such cases are really referable to *delusional insanity*.

Even in the midst of the highest civilisation, under exceptional conditions such as those of war, and even in ordinary circumstances, what are considered *animal traits* in human character are by no means uncommon. These include, unfortunately, some of the worst qualities, intellectual or moral, of human nature—some of its most degrading *vices*; such as so-called tiger-like ferocity or blood-thirsti-

ness, fox-like cunning or craftiness, and cat-like treachery. John Stuart Mill points out, in his volume on 'Nature,' that there are persons 'who have a real pleasure in inflicting or seeing the infliction of *pain*. This kind of *cruelty* is not mere hard-heartedness, or absence of pity or remorse. It is a positive thing, a particular kind of voluptuous excitement.' It is more also, for it is too frequently a symptom or feature of what is known to medico-psychologists as *moral insanity*. In another chapter it is shown that such qualities are less characteristic of other animals, however, than of man himself, and that it would be more correct to speak of these human peculiarities as occasionally marring the nature of the nobler 'lower' animals.

There is always a bestial tendency in man, however civilised, a liability to the development of theroid instincts, an aptitude for reversion or degeneration, in morals and intelligence, in passions and appetites, in general habits, and even in respect to that 'instinct' which is, or is supposed to be, typical of the character of zoologically lower animals. This proclivity is illustrated by all the mental phenomena we have been considering in this and the preceding chapter; that is, by the intellectual and moral conditions or peculiarities of—

1. Infancy and childhood.
2. Old age.
3. Savage, or primitive man.
4. The human idiot and lunatic.
5. The uneducated, criminal, and other classes in civilised communities.

MENTAL DEFECT AND DERANGEMENT.

CHAPTER III.

GENERAL CONSIDERATIONS.

THE study of the *pathology* of mind in the lower animals, of mind in its diseased or disordered states, seems to me to be of great, though yet unacknowledged, importance, because—

1. It throws much light on the *physiology* of mind, on its normal phenomena. For instance, the presence of *imagination* in animals is readily inferred from the existence of *delusions*, which are *morbid* phenomena.

2. It rectifies certain *popular errors*—for instance, regarding *rabies* and hydrophobia, by showing that most of the so-called 'madness' of the lower animals is of a totally different kind, belonging, in fact, to the same category as human 'insanity.'

3. A study of mind, which regards only its *healthy* manifestations, is one-sided and therefore imperfect.

4. There are many phenomena belonging to the borderland between health and disease that cannot be understood without a due knowledge both of the pathology and physiology of mind.

5. Health passes into disease so imperceptibly that—just as in man—what is normal or natural in one species or individual, may be a significant indication of serious disease in another.

6. Mental defect or disorder in such animals as the horse, ox, and dog is the source of much *danger to human life*, as well as the cause of heavy *pecuniary loss* to their owners and to society.

It is, in the first place, important to realise the fact that there is much 'madness' in the lower animals that is—

1. Certainly not referable to *rabies*.
2. Only doubtfully referable to it (Fleming).
3. Or only resembles it (Ramazzini).
4. Simply the result of heat (Ramazzini).
5. Or certainly or probably due to Anthrax (Ramazzini).
6. Referable to phrenitis, sturdy, distemper, worms, or other bodily diseases, functional or organic.
7. Referable to *insanity*, as it occurs in man, or to mere ephemeral excitement not amounting to insanity.

Just as in man, *mental* disorder may be *primary*: it may itself constitute the only apparent or the chief disease, morbid *bodily* conditions, if they exist to a demonstrable extent or in appreciable form, being in all senses secondary. In other words, there is decided predominance of morbid *mental* symptoms, to the comparative exclusion of those which are physical. Or on the other hand, mental disorders may be *secondary* in every sense; they may be merely concomitants or results of, or intercurrent with, serious bodily disease of a provable kind. In the one class of cases we speak of insanity being *idiopathic*, or we restrict to that class the term insanity itself. In the other class the mental epiphenomena are described as *symptomatic* or sympathetic; instances of which are to be found in the sympathetic derangement of the functions of the brain and general nervous system from digestive disorder in the horse, or from the presence of worms in the intestinal canal. It is quite legitimate to speak of the *insanity* of rabies, sturdy, distemper, or other bodily diseases of the lower animals, as a synonym for the morbid mental phenomena which usually or invariably accompany them in some or in all of their stages, because these mental states are of, or in, themselves of sufficient consequence to require special study and treatment. But it is certainly more convenient to restrict the term *insanity*, which both in man and other animals is

objectionable in so far as it is equally applicable to *bodily* as to mental unsoundness, to cases where the mental disorder is *primary* or idiopathic. Practically these two classes of morbid mental phenomena—the primary and secondary—have hitherto been confounded, a proof whereof is to be found in the *synonymy* of animal 'madness,' which includes:—

1. Franticness, frenzy, fury, ferocity, furiosity.
2. Delirium and raving.
3. Rabies and hydrophobia.
4. Vice and viciousness.

In the middle, and probably also in the earlier ages, the *insanity* of the lower animals was recognised; but it was ascribed to—

1. Demoniacal or diabolic possession, or diabolism.
2. Witchcraft or witchery.
3. Sorcery or spell-casting.
4. Or to other forms of supernatural agency.

Bewitched or possessed animals seem to have been mostly, if not always, of a black or dark colour of skin or its appendages, a circumstance associated with the nervo-sanguine temperament, which has been described as one of the predisposing causes of insanity in animals—for instance, in the Arab horse (Pierquin).

'Possessed' animals included especially the cat, horse, dog, sheep, goat, pig, and cattle, and indeed almost all the domestic animals (Pierquin). Of these the poor cat appears to have been a peculiarly suspected animal, especially if black; and, as already stated, it was in black animals generally that evil spirits or demons were believed to reside. Insanity in them, in the form of possession, was considered a proof of sorcery by man—a superstition that gave rise to many a fatal result equally to suspected men and animals.

But in those days *human* insanity was equally supposed to be a sort of demono-mania—a possession by the devil—the result of magic, witchcraft, sorcery, incantation, or charms. Demonology became quite a popular science. Visions of the devil were readily and voluntarily produced by drugs, such as mandragora, poppy, or hyoscyamus. Sorcerers' ointments, too, were in great repute.

In certain remote parts of Scotland, even at the present day, where primitive ideas or superstitions have not quite died out, it is evident that some forms of mental defect, disorder or eccentricity are attributed to domestic animals having been crossed by imaginary water kelpies, water bulls, or water horses. Thus the 'Nether Lochaber' correspondent of the 'Inverness Courier' refers to this superstition so lately as 1874.[1] He remarks that horses, 'much given to shying in the daytime without apparent cause, and a fondness when out at grass of wading through rivers and streams, and standing in listless, meditative mood by the margin of pools, may be confidently set down as descendants, in a nearer or remoter degree, of some demon-steed progenitor.' Foals which result from a union of the fabulous water horse and our own domestic animal, the common horse, are said to be known by their flashing eyes and fiery spirit. 'Even to this day . . . . if a young heifer gives much trouble in the milking, and is recalcitrant and reluctant to have her head bound up in her stall . . . . it may be gravely suspected that she has more or less of the old water-bull blood in her veins.'

Nowadays, however, the equally great mistake is committed of confounding all the varied forms of animal insanity with rabies, distemper, and a number of other bodily diseases supposed to be peculiar to the lower animals, diseases that are regarded as contagious, and that are frequently incurable, while they are usually dangerous to man and to other animals. Though madness is admittedly more or less common in such animals as the dog, horse, ox, elephant, cat and sheep, though the affected animals are popularly described as infuriated, enraged, maddened, frenzied, crazed, cranky, ferocious or vicious, and though we quite appropriately use such expressions applied to the lower animals as loss of wits, of senses, or of head, there is a singular reluctance to believe or admit that the mental phenomena described by such phrases are really the *same in kind* in man and other animals, and that, if it is proper to apply the term *insanity* to the one class of cases, it is incumbent on us to apply it equally to the other.

[1] In the number of that newspaper for November 5, 1874.

Up to the present date, it may be confidently asserted, especially as regards Britain, that animal insanity has not been duly recognised because it has never been properly or specially studied. When it is so, in the same way and to the same extent, as human insanity has attracted special notice, it will be found in all probability to be quite as common under similar circumstances—to be produced, that is to say, by *similar causes*. And a true conception of the real nature of the majority of cases of so-called 'madness' will go far to revolutionise the present *treatment* of animals, both by veterinarians and the general public.

At present there is a great want of recorded cases, properly observed, described, and authenticated, of certain of the *forms* of animal insanity; and the young veterinarian could not select a more promising field of research for his maiden investigations.

From the present absurd and inhuman practice of at once shooting or poisoning animals that become for the moment useless or dangerous to man; from the comparative or utter absence of hospital treatment for animals reputedly mad, there is at present small opportunity of studying the phenomena of *animal* insanity—phenomena, nevertheless, a knowledge of which is of the utmost importance in relation to a proper knowledge of *human* insanity. And hence there is an apparent deficiency or infrequency of various forms of insanity that would probably equally show themselves in other animals, as in man, were opportunity for their development on the one hand, and their study on the other, presented.

At present there are hosts of points in the natural history of animal insanity that cannot be determined in the absence of the requisite data. Thus it is impossible to say whether animal insanity is more frequent now than it was in the Middle Ages. It has been asserted that it was then more common; but the greater frequency may have been—and indeed probably was—merely apparent, in consequence of the greater degree of attention then bestowed upon animals that were reputedly bewitched or possessed. Nor can we safely assert that insanity is absolutely more common among domestic than wild animals, among town or drawing-room

pets, than among country-bred denizens of the farmyard. The probability is—as is shown more fully in the chapters on 'The Etiology of Insanity'—that the artificial luxurious life of city pets, or the compulsory confinement of menagerie animals, produces a much larger proportion of cases of mental aberration than the free, natural life of the wild state.

In the study of animal insanity we must not forget to make all due allowance for the disadvantage at which we are placed by the absence in the lower animals of *speech and writing*, and the want therefore and thereby of that assistance which in man spoken and written words afford us in the diagnosis of insanity. But, on the other hand, too much stress must not be laid on what is or arises from an anatomical and physiological difference; for in man himself there are large numbers of persons—insane, imbecile, idiotic, deaf-mute, or aphasic, as well as children and the aged—who afford no clue to their insanity either by speech or writing, many being unable to articulate sounds in the form of words, others being ungifted with the power of writing, while others, again, possessing both sets of powers, make practical use of neither.

In such cases we must judge, as in animals, from the character of *action*, which may appropriately include not only gestures, attitudes, movements, gait, carriage, conduct, but looks, and voice-sounds such as murmurs and cries. Every physician who is experienced in the observation of the phenomena of human insanity, who is acquainted especially with its medico-legal aspects—with those cases of disputed or doubtful insanity which so frequently become the subjects of actions at law—knows full well the absurdity or fallacy of basing a judgment sometimes on mere speech or writing, conversation or letters. In truth, it happens too frequently, both in sane and insane life among men, that speech and writing are used to *conceal*, not to expound or exhibit the real feelings or ideas. From this and other causes it happens that no insanity may appear in the conversation or letters of an otherwise insane man, who has sufficient intelligence and self-control to know the effect of unguardedly giving utterance to certain opinions, of the rectitude of which he is nevertheless quite convinced, and to guard his expressions

accordingly. But the same individual may nevertheless, especially when believing himself unwatched, and, therefore, off his guard, exhibit decided *insanity* of *action*; and this may be the only mode of its manifestation. By speech he may betray himself only during unguarded moments, or when self-control becomes impossible.

Now, in the lower animals we have mainly to deal with this *insanity* of *action*, the only form in which demonstrable insanity exists in many men. It is only the 'overt acts' of the latter that bring their mental condition under the notice of the physician, and themselves under the ban of the law. In animals we have almost exclusively their acts as indications of insanity—acts that are contrary to the usual habits, nature or character, as well as to the interests, of the species or individual.

But, in some exceptional cases among animals, when a certain degree or kind of speech has been one of their accomplishments—for instance, in some parrots—there is veritable *incoherence* both of ideas and words. Incoherence of speech in animals that have been taught to talk intelligently and intelligibly, or even to repeat phrases correctly, usually betokens and accompanies the mental decay of senility, though it may and does occur also in more decided forms of insanity. The application of such a term as 'raving' to the delirium or mania of the lower animals is not, therefore, so objectionable as might at first sight appear. It becomes inapplicable, and simply figurative or absurd, only when there is and was no power of articulate speech.

Incongruity of action, however—in the striking want of relation between the acts or actions, behaviour or conduct, and the surrounding circumstances or conditions in which the animal is placed—is an equivalent of incoherence of vocal or articulate language.

In the *diagnosis* of insanity in the lower animals many *difficulties* must present themselves to the student. These difficulties include the following: that of—

1. Drawing the line between *passion* or anger and *mania*.

The real difference—one of name merely—must frequently be determined less by the intensity than duration of the pas-

sion. In other animals, as in man, mania is sometimes only a chronic or protracted passion or fury, while

Ira furor brevis est.

Passion undoubtedly passes into mania, both in other animals and in man.

Pierquin goes the length of suggesting or asserting that certain of the lower animals may or do *simulate* mania, passion or fury—for instance, for the purpose of intimidating enemies, and possibly also with a view to shirk uncongenial work. Hence the necessity of—

2. Distinguishing between *real* and *simulated* fury, between that which is dangerous and that which is innocuous.

3. Separating the calculating or calculated violence of mere *temper* from the more dangerous, blind, impulsive, uncalculating and unpremeditated fury of disease.

4. This includes the differentiation of corrigible from incorrigible *vice*—the first a preventible temporary fault of temper, the second the result of genuine cerebral or nervous disease.

Thus the custodians or masters of such animals as the horse constantly fail to distinguish between corrigible laziness or disinclination to work, because work is uncongenial, and that incapacity for work which is so frequently one of the premonitory signs of insanity or other diseases, mental or bodily.

5. Distinguishing between the *eccentricity* of mere individuality, which is compatible with mental and bodily health, and that eccentricity which is the outcome of *disease*, mental or bodily.

6. Separating the *excitement* of mere sport—of courtship, of the race or chase, of fight or war, of rivalry or novelty—from the mental excitement which characterises rabies, distemper, phrenitis or sturdy, or which forms so common a precursor of insanity.

7. Telling the animal that is only temporarily 'distraught' or 'out of its wits' from the mental confusion produced by novel and conflicting sights and noises in the hunted dog or ox of the city streets, as contrasted with the animal that

is normally stupid, or congenitally idiotic, or in a state of melancholia or dementia.

8. Confounding the *stupidity* arising from mere unfamiliarity with man in wild animals, with that which is the result of the misplaced confidence of those domestic ones that have had ample experience of his treachery or cruelty.

Even by *veterinarians* there is frequent *confusion* of other diseases with insanity, or with each other; for instance, of—

1. Rabies, with certain forms of insanity, including—
   - *a.* Mania from intestinal worms in the dog, in whom the symptoms are frequently anomalous, resembling those of rabies (Youatt).
   - *b.* The phenomena of the incubation or inception stages of rabies with those of insanity, which are frequently indistinguishable.
2. Distemper with rabies.
3. Typhus with rabies.
4. Delirium, with delusion or its expressions in rabies.
5. Epilepsy with megrims in the horse.

In the *diagnosis* of human insanity, in its differentiation from the diseases with which it is apt to be confounded, even the experienced physician constantly encounters the same kind of difficulties. Thus the professed medico-psychologist, or the medico-legal expert, is constantly being puzzled—

1. To distinguish the mental confusion, excitement, exhilaration, or the gait of *drunkenness* from the similar mental and motor phenomena of *apoplexy*, aphasia, hemiplegia, paraplegia, or other diseases of the brain—a feat that has so frequently baffled the policemen, if not also the experienced police surgeons of London and other large cities, a patient's life having been not seldom the penalty of the difficulty, doubt or mistake.

2. To separate mere criminality or moral vice or *viciousness* from insanity, especially from that form thereof known as *moral insanity*—a difficulty which some authors get over by regarding all vice and crime as the outcome of mental or moral defect or disorder.

3. To differentiate the *delirium* of fevers, and especially of drinking fever, delirium tremens, from *delusional mania.*

4. To separate *mania* from other comparatively transient conditions which resemble it.

5. To avoid the confusion of real with *spurious hydrophobia*; or of hydrophobia, whether real or spurious, with other diseases, such as hysteria, delirium tremens, and phrenitis.

6. To distinguish between *hysteria*—especially cataleptic hysteria—chorea, and insanity.

7. To beware of confounding the mere sulkiness and *laziness* of the schoolboy, his indifference to, or disinclination for, lessons, his refusal to learn or execute a task, with actual *mental incapacity* or inability, the result of organic disease of the brain, of congenital defect, or of acquired insanity, a mistake—sometimes fatal—occasionally committed both by teachers and parents.

8. To avoid in general terms confounding mental with other disorders, or to distinguish the affections with which insanity may be confounded.

9. To distinguish between certain premonitions, forms and *causes* of insanity, as well as between exciting and predisposing causes, for instance, in such cases as intense emotion or excitement.

10. To determine the boundary line between *sanity* and insanity, one which it is simply impossible to establish.

There is frequent confusion of *causes* with results or effects. Thus *emotion* may be a cause, form or premonitory symptom of insanity, according to its nature, intensity, duration and sequence. The same may be said of mental excitement. It is difficult to tell when or where it passes into mania, to determine the kind or degree that constitutes disease. *Eccentricity* again may be premonitory of, or amount to, insanity, or it may not be referable to the category of disease at all.

If such difficulties occur in *man*, in whom aid is to be had from speech and writing, they are not likely to be less among the lower animals, in whom no such aid as a rule is possible. On the whole, however, it cannot be said that there is greater difficulty in the *diagnosis of insanity* in other animals than in man. In both cases the difficulties are

of essentially the *same nature*. Perhaps the chief difficulty in the lower animals is in the determination of the presence and character of sensorial and intellectual *delusions*, a subject, however, that is discussed in a separate chapter.

Much to man's discredit, what *he* fails to detect is occasionally *detected by animals* themselves. Thus mental or moral peculiarities in their young that escape man's notice, are nevertheless observed, and their significance understood, by their own mothers—a result attributable probably to their superior love, interest, sympathy, watchfulness, and keenness of observation. A mother dog, horse, or other animal sometimes detects what escapes even the veterinarian. Thus Houzeau tells the story of an idiot or imbecile dog-pup whose mother had noted its peculiarity, its want of mind, its mental inferiority to its brother pups, its incapacity to fend or provide for itself; and had, so recognising its incompetency, supplied it specially with food. In other words, where man fails, certain of the lower animals themselves form a correct *diagnosis* or estimation of the nature and consequences of mental defect or derangement in their offspring or companions.

In short, one of the most beautiful and beneficent illustrations of maternal solicitude as well as sagacity is this special care taken by mothers of the imbecile or helpless. The female dog or cat recognises in her offspring any physical or mental want or disability, when it either entirely escapes man's notice, or long before it becomes sufficiently obvious to attract his attention.

The *method of diagnosis*, the mode of studying insanity in other animals is the same as in man. There is no single *test* or criterion for distinguishing between sanity and insanity, health and disease, unless in so far as it can be said that the application of *kindness*, for instance, is a test between sanity and insanity. If it be found impossible to correct vices of character by persistent kind treatment, it is at least highly probable that mental or moral defect or disorder exists, other corroborative indications of which should then be looked for. On the other hand such a test is so little to be trusted that in certain cases of indubitable insanity there

is no such potent influence as kindness, none so likely to conduce towards the promotion of recovery.

The *standard* by which we must judge in every *individual* case is the normal or natural character, the usual mental health and habits of the animal affected or suspected, when the alleged insanity has been developed in adolescence, maturity, or old age; and the average disposition and mode of life of the *species* in cases of congenital defect, or of insanity occurring soon after birth. Hence the importance of a careful study of an animal's *antecedents*, the history of its previous character and habits, and if possible that also of its ancestry, just as in man.

We must take also into due consideration points of such importance as the *absence of motive* or cause for given actions; the unsuitability of these actions to an animal's strength or structure; the opposition of its new or unusual habits to the natural manners of the individual, species, genus, or family.

The general *symptoms* or phenomena of mental derangement in other animals are virtually the same as in man, making all allowance, of course, for the very different structure and habits of different families, genera and species. The special symptoms of the several recognised forms of insanity are given in another chapter. But the general premonitory symptoms, what are technically called the *prodromata* or forewarnings common to all the various forms of mental disorder, deserve and demand consideration here. They are obviously of great importance and significance, the more so that they are not specially diagnostic of insanity, not confined thereto. On the contrary, they are common to the incipient stages of many other disorders of the brain or nervous system, of the general system, or of other special bodily organs. These prodromata constitute in themselves morbid mental conditions, worthy of all attention, including as they do the following:—

1. *Sleeplessness*, sleep disturbance, or sleepiness with incapacity for proper sleep. Want of sleep is a common cause of insanity, as in man, as well as a common premonitory sign of insanity.

2. The reverse condition of morbid drowsiness or *somnolence* at unusual times, or excessive in amount or degree, is far less frequent.

3. Morbid *taciturnity* or silence, or the reverse states of unusual noisiness or boisterousness.

4. Desire for *isolation*.

5. *Irritability*, or other infirmities of temper, including passionateness, causeless passion, or anger aroused by the most trivial causes.

6. Low or bad spirits, moroseness, sadness, or *melancholy*; or

7. The reverse condition of superfluity or exuberance of good spirits, *extreme vivacity*—a common precursor of insanity also in man.

8. *Loss*—partial or total—*of memory*, which becomes more marked in proportion as dementia or other forms of insanity are developed. It is naturally most familiar in senile forms of mental decay or degeneration.

9. *Loss*—partial or total—of the power of *will*, which is in itself a state of mental deficiency, if not of alienation. Infirmity of *purpose* is commonly associated with weakness of mind, or weakening of the mind, for instance in age. The movements then want aim, object, design, definite idea or method.

10. Alterations in the *emotional* state, including pathological perversions of the natural *affections*.

11. *Confusion of ideas* exists in many of the minor forms of insanity. Derangement of the ideas, and of the process of ideation, the development of *morbid ideas* occur both in dreams and delusions.

12. Perversion or destruction of the *moral sense*.

13. *Loss of self-possession*, leading frequently to panic and precipitate flight.

14. *Loss of normal virtues*, such as docility, mildness, benevolence, caution.

15. 'Silliness' of behaviour, such as to attract the notice of by no means specially observant human onlookers.

As might be expected, the symptomatology of insanity in the lower animals most closely resembles that of human in-

sanity in species that stand nearest man in habits or structure, for instance, in the dog.

In other animals, as in man, insanity may be said to exhibit two *stages of development*:—

1. The stage of inception or incubation—the premonitory period—the condition of changed habit and disposition; and

2. The more decided state of alienation proper.

The symptoms of the first stage have already been considered in the present chapter. The symptoms, on the other hand, of insanity proper are detailed in the chapter devoted to the *forms* of mental defect and derangement.

But no practical advantage results from such a classification, or separation of stages. The one group of symptoms passes into the other, and they become variously intermixed, so that it is impossible to draw any scientific line of demarcation. What is of more importance practically is that—

1. As has already been pointed out, insanity in other animals, as in man, is sometimes preceded by symptoms common to, or resembling those of, acute inflammations of the brain and spinal cord, or their membranes, or of other bodily diseases; while

2. The *incidence* of insanity, whether sudden or gradual, both in other animals and in man, is sometimes most puzzling and insidious, requiring all the skill and caution of even the experienced physician and veterinarian to distinguish the true character and significance of the symptoms by which it is marked.

The period and the circumstances of the *invasion* or commencement of insanity are at all times difficult to determine. At first the symptoms are usually not salient, and are appreciable, if so at all, only by the expert (Pierquin). This is the case equally in other animals and man. The early indications, the premonitions or forecastings, of coming mental disaster, are apt to be unobserved and overlooked. Both subsequent progress and beginning, moreover, may be as different in different animals, and even in different individuals of the same species, as they are in different men under different circumstances.

The *suddenness* of the seizure may therefore be more

apparent than real, for instance in cattle being driven to market through the streets of large cities. As is shown in another chapter, these animals have been *predisposed* to a sudden outbreak of mania by a long course of previous faulty treatment, resulting in a morbid nervous or general condition.

The natural *terminations* of acute insanity in other animals, as in man, are—

1. Recovery.
2. Dementia.
3. Death; immediately preceded or not by
    a. General tremor or violent agitation of the whole muscular system, not amounting to convulsion.
    b. Convulsions of various degrees of severity.
    c. Complete or incomplete stupor or coma.
    d. Paralysis in various forms and degrees.
    e. General exhaustion or marasmus.

The *results* to man of animal insanity are of the highest importance, involving as they do—

1. Uselessness for work and for food.
2. Danger to human life; and
3. Serious pecuniary loss.

One of the commonest results of animal insanity is uselessness of the affected animal to man, involving commercial disability, marketable valuelessness. It is therefore in this form alone costly and expensive. But paramount in importance is the risk of injury to man, to their companions, even to themselves, the danger involved in *accidents* produced by insane animals, for instance by

1. Runaway horses.
2. Mad (rabietic) or otherwise insane dogs.
3. Crazed cattle.
4. Sturdied sheep.
5. Rogue elephants.

The accidents in question include—

A. In or to man, directly or indirectly:—

1. The upsetting of carriages of all kinds and the killing of those who occupied them.

2. The fatal throwing of riders.

3. Deaths from real or spurious hydrophobia.

4. Goring to death by bulls.

5. Fatal results of loss of presence of mind in man.

6. Murder by rogue elephants.

7. Plunder or destruction of man's dwellings and crops by the same animals.

B. In or to the *animals themselves.*

8. Self-destruction, sometimes wholesale in panic from sympathy and imitation.

9. The injury of other valuable animals belonging to man.

Danger and dangerousness to man are not confined, however, to

1. Insanity, or certain forms thereof; nor to—

2. Man-eaters or slayers, such as the elephant, tiger and lion.

It arises equally from—

3. Alarm, terror, fright, or their resultant panic.

4. The fury or ferocity of rutting, parturition, incubation, maternity.

5. The despair of bay, the desperation and courage of even naturally quiet, harmless animals, when attacked and wounded.

6. The impulses, natural or morbid, of captive feral animals, a risk frequently illustrated in menageries, especially under provocation by man.

7. Sensory defects, especially of vision.

8. Delusion.

9. Vices or peculiarities of habit of various kinds.

10. Irritability and loss of temper, and the assaults—biting or kicking—by which it is so apt to express itself.

11. Phrenitis, or other acute diseases, attended with morbid motor phenomena.

12. In general, all diseases accompanied by, or leading to, change of temper or the development of vicious propensities.

Man exacts from fellow man a *warranty* of the physical character of such animals as the horse. But a guarantee or certification of its mental or *moral* character is at least quite

as important as its mere bodily 'points,' inasmuch as moral or intellectual defect or disorder is quite as frequently and as much a source of danger or loss to man as defect or disorder of muscle or sinew.

There are still several points connected with the natural history of animal insanity deserving of consideration. But they are mentioned here mainly as offering suggestions for inquiry; for at present we possess little or no definite information thereanent.

For instance, Weith represents animal insanity as rare before *puberty*, a statement that is probably correct. Levrat asserts that insanity in the horse is usually developed after the age of six.

Of the relative *liability of the sexes* to insanity we know at present nothing definite. It might appear at first sight, and without due consideration, that the *female* is likely to be more liable than the male, seeing that pregnancy and parturition are such disturbing agents or agencies. But, on the other hand, as in man, it is the *male* that is the usual bread-winner, protector, leader; and he has cares and dangers that may, and probably do, counterbalance the physiological peculiarities of his mate.

As regards the relative liability of *domestic and wild* animals, it is natural to conclude that the former are more subject than the latter, for two reasons—

1. That we are much more familiar with domestic animals, and that all their peculiarities, mental and bodily, come under our notice; and

2. That we know the results in man of the kind of artificial, luxurious, enervating life which is led by animal pets.

But it must be borne in mind that *wild* animals are subject to a series of mental strains of a kind unknown to domestic ones living under man's protection. The struggle for existence, especially against man, with all his wiles and skill, is attended with mental anxieties, with physical want and exposure, that may well be supposed to counterbalance the overfeeding, the want of exercise, the non-gratification of the sexual instinct in the fat, lazy, irritable, mangy, pampered drawing-room favourite.

In this and similar cases we require *statistics* of a kind similar to those that have been so carefully collected in connection with human insanity.

It so happens, however, that it remains to be determined by proper statistics or data, whether *savage or civilised man* is the more or less liable to insanity. The general belief is that insanity is rare among savages, where mind is undeveloped or uncultivated; while we know only too well how frequent it is in civilised communities. But it may be infrequent in the former just because—as in the case of insane animals—so soon as a savage becomes insane, and thereby troublesome, dangerous, or useless, he is summarily destroyed. From the evidence of many travellers, we know, on the one hand, that such summary treatment is practised; for instance, by the Cunas Indians of Columbia, South America, among whom 'a female, who became insane, was hung from a tree and burned' (Brown); or by the Central African races, a man belonging to whom petitioned Stanley for permission to 'cut her head off at once' with a drawn sword, the intended victim being the man's own wife.

On the other hand, among certain Eastern peoples—for instance, in Egypt, Syria, and Palestine, where idiots, imbeciles and lunatics are protected by kindly superstition—these afflicted ones being invested with an odour of sanctity—various forms of insanity or idiocy are far from uncommon, even on the public thoroughfares, where I have myself seen them.

But even as regards the same country the evidence of travellers is very conflicting. Thus, as regards the Negroes of Central Africa, some authors, such as Baker, describe idiots and lunatics as extremely rare, if not absolutely unknown; while others, such as Speke, talk of them as by no means infrequent. Nor can it be said to have been determined whether human insanity in our own country is more prevalent in the uneducated inhabitants of rural districts, or the highly-skilled, closely-pent artisans of crowded cities.

Hitherto popular, as well as professional, opinion has been altogether in favour of the view that considers the evils of city life as far more potent in the production of disease, both

mental and bodily, than those of rural existence. But recent statistical researches, and especially those of the Scottish Board of Lunacy, bring out the fact that more is to be feared from ignorance than from education, even weighted as the latter is with insanitary conditions of life not more favourable to mental than to bodily health.

In judging of the relative liability to insanity in *different genera and species* of animals, the same kind of fallacies present themselves. We are too apt to suppose that to be most common which simply comes most frequently within our own ken. The susceptibility to madness is generally supposed to be greatest in the dog, because probably—

1. He is the most intelligent and sensitive of the lower animals.

2. He resembles his master in the artificial, unhealthy character of his habits; while

3. His structure is in many respects the same, or similar.

But the greater frequency of insanity in the dog may be only apparent—because of his intimate association with man, and his coming much more, therefore, under man's notice than any other of the lower animals. On the other hand, in Scotland at least, insanity is perhaps most familiar in the ox, in the form of ephemeral mania.

It is probable—but it has yet to be proved—that mental derangement in the lower animals bears a certain proportion or relation to *superiority of type* of mind, or of brain and general nervous organisation; in other words, that it is to be looked for most frequently in dogs, horses, and other animals of high breeding and fine nervous susceptibility.

Madness, apparently of the character of human insanity, has been described or referred to in the chimpanzee (Forbes), horse (Levrat, Pierquin), elephant, dog and cat, cow and bull, sheep and hen, and even in the ant (Latreille), and bee (Figuier). But the exact character of the 'madness' in the cases of these very different genera and species differs considerably, though not correspondingly. In some cases it is genuine insanity of the nature of that which occurs in man, while in others we are left in doubt as to the precise character of the so-called 'madness.'

Thus among beavers there are individuals known to trappers as 'les paresseux,' or 'idlers,' which are more easily captured than the others, and which appear to be exiled males, leading purposeless and somewhat lonely lives. They lose sociality and wariness, and 'walk into traps without seeming to know their danger;' while old, experienced, healthy animals at once detect traps and baits, and destroy the efficiency of both by sinking them under water (Wood). In this case banishment, solitude, the want of society and its consequences—physical and moral—have no doubt begotten a morbid mental condition similar to that which is much more familiar, and much more dangerous, in the rogue elephant.

Again, 'it is said by the natives of South Africa that the gnu is a mad animal; and the manner in which they rush about . . . . . would certainly impress you with this idea.' With their flowing tails 'they lash themselves perpetually, whirling and rushing about in all directions from and towards you' (Bisset[1]). But it is contrary to all analogy to suppose that any animal species, as a *species*—in other words, that all the individuals of a species are normally mad, however eccentric their behaviour may appear to be to those who probably are ignorant of its cause or motive. A similar explanation of the singular behaviour of the Tasmanian devil, viz. that it is the subject of a chronic mania, has been offered by the late Professor Day, of St. Andrews, but on what seem to me to be equally untenable grounds.[2] And there are no doubt many other animals reputedly mad that are so only in appearance, that owe their evil repute simply to some eccentricity of behaviour to which man has not at present the key.

The excitement of bees previous to swarming amounts, according to Figuier, to mental derangement, the queen setting a bad example by being the first, figuratively, to lose her head. The 'mad ant' of the Malays is characterised by its objectless movements (Darwin).

The *range* of insanity in the animal kingdom has yet to be determined; what species and genera are subject to insanity and to what forms of insanity; how low down in the

[1] 'Sport and War in South Africa,' 1875. P. 262.
[2] 'Scottish Naturalist,' vol. iii. p. 60.

zoological scale insanity reaches. Dunne goes the length of asserting—incautiously and probably much too sweepingly—that it affects, or may affect, *all* animals. This may be, and probably is, going too far. There may be nothing analogous to human insanity in the lowest animal organisms. And yet it is an obvious inference, from all that has already been determined regarding insanity and other diseases in the lower animals, that wherever there is healthy, there may also be *morbid*, sensation, emotion, memory or volition. We cannot conceive the existence of the physiological without the pathological condition also. We must hold then that feeling and thought, wherever they can be shown to exist, are as liable to be deranged in other animals as in man.

At present morbid mental phenomena have been mostly observed—if properly observed at all—among the domestic vertebrata or mammalia. But their study in other and lower animals by the physician or veterinarian, naturalist or comparative psychologist, cannot fail to bring to light many data of the highest interest in relation to man's knowledge of human insanity.

The alleged greater prevalence of insanity in the Middle Ages, which has already been adverted to, was no doubt attributable to such facts as the following :—

1. That 'madness' then included rabies, distemper, and other diseases, attended with striking morbid mental phenomena of the delirium type.

2. That it probably included also forms of mere eccentricity or marked individuality.

3. That man's superstition attributed 'possession' to certain animals for no other reason sometimes or perhaps than the blackness of their skin, fur, feathers or hair.

Formerly, for instance, madness is said to have been common in the Scotch Highlands, whereas now it is stated to be rare, the difference being not one of fact, but of opinion, the apparent or real rarity now-a-days being ascribable to the greater freedom from superstition among the peasantry, (McDowall).

The *duration* of insanity in the lower animals is extremely variable. It may be—

1. Temporary, transient, momentary or ephemeral; or

2. Permanent, chronic, confirmed. It may also be, in either case, while it lasts—

3. Continuous, without a break; or

4. Intermittent, remittent, paroxysmal or periodical, occurring in fits at varying intervals, all as in human insanity.

The *frequency* of recurrence of the attacks; their *number* in an animal's lifetime; the duration of the *interval* between each attack; the nature of the interval, whether marked by lucidity or recovery, are all points on which information is at present desiderated.

Practically the *duration* of animal insanity is generally determined by man's habit of destroying all insane animals as soon as their mental disability becomes apparent, and alarms him by its supposed or real dangerousness. Thus it happens that man's experience is confined almost entirely to recent or *acute* cases—lasting, that is, not more than from an hour or two to a day or two.

Mania in the lower animals is usually *acute*, ephemeral or transitory, simply because it is not suffered by man or by companion animals to become *chronic*. A dangerous animal —and every maniacal animal is necessarily dangerous—is at once sacrificed to man's or to the general safety. Nevertheless Pierquin describes *chronic* mania in the horse as characterised by impetuosity, fury or ferocity, ungovernable temper, general assaults on persons coming within its reach, and unamenability to punitive treatment, which is obviously, in such a case, futile and out of place.

The *period* of development of insanity in relation to *season* is another subject on which definite information is required. Attacks of the *epidemic* or epizootic forms are said to occur mostly in summer and autumn (Ecker), an assertion, however, that requires confirmation. The only epidemic form of insanity that is familiar or common, viz. panic or stampede in horses or cattle, is not determined by causes that have any special or direct relation to season, though there can be no doubt of the direct effects of solar heat and of insect plagues —so common to the hot days of summer—in producing acute ephemeral mania, which may simultaneously affect a number of animals.

It would appear as if a *change of type* had occurred in animal insanity since the Middle Ages, and even since Pierquin's day. It would seem that there is now less furiosity or acute mania and more of other forms of insanity. But there is no very substantial ground for such an opinion.

That there will, however, be a most decided change of type—when there is a change in man's treatment of the lower animals in general, and of their insanity in particular; when it becomes generally known and accepted that other animals besides man possess mind of the same kind as his; that this mind is subject to the same class of disorders, producible by similar causes; that similar treatment is called for as in the case of human insanity—a treatment which is now generally spoken of as the humane system; and that humanity to subject animals is man's best policy, even for his own selfish ends—I have no hesitation in predicting. When all those sources of irritation or provocation are removed that are at present the main causes of the development of furiosity, when animals in the early and dangerous stages of mental disorder are either left to themselves—protected from annoyance—or gently and judiciously dealt with, I have little doubt that acute, murderous, or homicidal mania, for instance, will become less common, if it do not altogether disappear—just as the furious mania of the Hogarthian days of the old Bedlam of London has become infrequent in man, as the result of the change that has occurred during the last half-century in popular opinion concerning the true nature of man's insanity and its proper treatment.

Of the relative *frequency* of occurrence of the different *forms* of animal insanity nothing of a precise kind can at present be said to be known. Mania and melancholia are common, at least in their acute stage, because they are frequently or generally suddenly developed. Other forms are apparently or really less common, probably simply because--

1. Man does not take the trouble to look for them; while

2. He loses no time in ridding himself of animals that, by reason of disability, mental or bodily, have ceased to be useful or profitable to him.

One of the many *results* of animal insanity—including,

for instance, simple imbecility in all its degrees—is *incapacity for work*. While this may arise from deficient or disordered intelligence, it is also produced by ignorance or carelessness, indifference or dissimulation, laziness or refusal. But some of these conditions are themselves frequently the results of mental derangement. Certain animals make practical, often dangerous, protests against all kinds of work, or against some kinds only, or against overwork. Work may be congenial or not, just as in man; and animals, even when thoroughly domesticated and habituated to labour, have their likings and dislikes for particular kinds of work. While as a rule trained animals work without difficulty, some labour with great willingness, heartiness, or zeal, showing an obvious interest in work. But inability for, or refusal to, work is only one of the many serious results to man from animal insanity, results that include also heavy pecuniary losses—

1. In animal property; for instance, in the case of Kane's Arctic dogs, and of Arctic dogs in general, when employed in the service of exploring expeditions.

2. In damage to other kinds of property, fixed or movable, such as crops, dwellings, fences, stable fittings; and last, but certainly not least,

3. Danger to, and loss of, human life.

There may or may not be demonstrable *necroscopic* conditions concomitant with insanity in the lower animals that may be regarded as standing in the relation of cause and effect. The microscope or the naked eye may reveal—or be supposed to do so—in the brain or spinal cord the presence of inflammations, or their products or results. But it has not yet been shown conclusively in human insanity that there is any necroscopic appearance, condition, or lesion that is peculiar to the insane, and that might, therefore, be regarded as diagnostic of the presence of insanity, or of any particular form thereof.

It is, again, one of the common errors, even of skilled physicians, to regard human insanity as always and necessarily a disease of *debility*, the truth being that, while it is frequently so, it is also associated with perfect apparent vigour of constitution both in other animals and in man.

SYMPTOMATOLOGY OF ANIMAL INSANITY.

CHAPTER IV.

FORMS OF MENTAL DEFECT AND DERANGEMENT.

CERTAIN, at least, of the lower animals are subject to the *same forms* of mental defect or want, the same sorts of destruction or perversion—total or partial—of intelligence, the same kinds of mental derangement, as man. There is, indeed, a wonderfully close parallelism, as was long ago pointed out by Pierquin and Levrat, between the mental defects and disorders of man and those of other animals, considering the very great difference in structure and habits.

The prevalent *forms* of mental defect and disorder that exist equally in man and other animals may be roughly but conveniently divided into—

1. Those which are *congenital*, which appear at birth; and

2. Those which are developed subsequently to birth, usually in maturity.

These two great classes of morbid mental or moral peculiarities have certain characters which place them in considerable contrast to each other. As a rule, the defects or disorders of the first class are life-long, confirmed, permanent and incurable; while many of those of the second class are of limited duration and curable.

Congenital mental defect includes all forms of want of

intelligence, between mere slight imbecility, marked by incapacity for education or self-support, and obvious idiocy (amentia); the intermediate conditions comprising what is known in man as fatuity, feebleness of intellect or mind (dementia), and such animals as are equivalent to what among men are denominated simpletons, fools, or naturals.

In its extreme form or degree *idiocy* (*amentia*), that is, an original and absolute or *complete absence* of mind, if such a thing ever really exists compatibly with life either in man or other animals, is rarely observed or studied among the lower animals, simply because whenever it becomes evident that a domestic animal is so far defective either in bodily or mental power as to be useless or burdensome to man, its life is ruthlessly and thoughtlessly sacrificed. We are as yet apparently far from that stage of civilisation, of humanity, and of common sense which will lead us to collect insane animals, as we do insane men, in *hospitals*, and so provide means for the scientific study of the various forms of animal insanity and their relative curability. What is called idiocy in animals is usually merely one of the minor forms of mental *imbecility*, some of which minor forms or degrees may show themselves simply as want of character, for instance in the cat (Browne). Thus Pierquin speaks of *partial* idiocy and incomplete dementia. Darwin refers to *semi*-idiocy in a dog, and describes its 'senseless habit' of rotation or gyration, a common phenomenon of insanity in that animal.

This mental imbecility, which includes all forms or degrees of *partial want* of mind or intelligence, is of great practical interest in connection with the incapacity for being trained or trusted that characterises animals which are its subjects, and with their responsibility and punishment for mistakes or misdemeanours. There is a non-intelligence, a normal *stupidity* which the poor animal cannot help, because it is the natural outcome of imperfect or arrested development of brain, which again is frequently the mere concomitant of defective development of the general nervous system, or of the general bodily organisation. Pierquin observes that the various degrees of mental imbecility—including idiocy—in the horse are usually accompaniments of small

brains, or are produced by the presence of cerebral hydatids, or by cerebral ramollissement; that they are most frequently associated with the lymphatic temperament, and with various morbid bodily conditions, including vices of conformation or structure, articular nodosities, and superficial growths. Both he and Houzeau speak of animal idiots or imbeciles as *cretins*, while, however, they give no evidence of the association of goitre with idiocy.

I have elsewhere shown[1] that *goitre* occurs in many animals; for instance, in Switzerland, where the goitrous condition is so common in the human idiot—the cretin. Though there is every probability of their concurrence, there is as yet, so far as I am aware, no proof of the concomitance of goitre and idiocy in the same animals, that is, of the existence of cretinism proper. It is most desirable that such a concomitance of morbid mental and bodily conditions should be carefully looked for wherever human cretinism exists; and I venture this suggestion in the hope that those who have opportunities of studying cretinism in man, will not fail to make inquiry as to the existence of a similar condition in other animals.

Mental imbecility, however—stupidity, non-intelligence—is not associated only with physical deformity or disease; for, as Pierquin points out, it co-exists sometimes in the horse and dog, just as in man or woman, with physical or personal *beauty*. The incongruity, however, is as great and as unusual in the lower as in the higher animal.

Whether associated with physical beauty or deformity, with health or disease, limited or defective intellect, deficient or impaired mental power or action renders an animal useless for any of man's purposes.

Pierquin describes what in man would be called *acute dementia* in a parrot as the result of fright or fear. It was on board ship during a naval battle. Previously a lively and intelligent ship pet, it showed its terror by cowering during the fight, became insensible to the usual civilities offered to it, acquired a dull stupid look, and made mono-

[1] 'Community of Disease in Man and other Animals.' Reprint from the 'British and Foreign Medico-Chirurgical Review' for January 1874. P. 17.

syllabic and unvarying replies to questions. This condition of mental imbecility became permanent.

A certain gamekeeper at Garnkirk, near Glasgow, judged of the mental capacity of his pups phrenologically--by the size and form of their heads. 'Out of a litter of blind pointer pups, this man, by examining their heads, could select those who could be easily trained for the field from among those who could not. Sometimes he would pick out what he called an idiwit, and that one to a certainty turned out incapable of being trained at all.'[1] Franconi speaks of idiots among circus horses as incapable of being trained, and as fit only for simple mechanical work.

This unfitness for education, this incapacity for mental development or progress, is a very common feature of the various degrees of mental imbecility. Another quite as important feature is *incorrigibility*, the incapacity of benefit from correction or punishment, for to the category of imbecility or dementia are no doubt to be referred sometimes certain *ineradicable vices*. In such cases, indeed, punishment is not only useless but cruel, and it is apt to become dangerous, by leading to the development of morbid and vicious propensities, such as biting or kicking.

Among the results or concomitants of mental imbecility in its various forms or degrees are certain *defects of temper* or character that are too apt to be regarded as mere vices, and treated as such, including, for instance, stubbornness, idleness, or indifference. In other cases, utter neglect of its own immediate personal wants, obvious mental confusion or bewilderment, inability either to think or act, a greater than infantile helplessness, bear evidence to the deficient cerebral power.

And lastly, various marked *eccentricities* of behaviour, such as the aimless piling up of miscellaneous and useless objects by the dog, are referable to mental disease of the kind we are now considering.

In some respects analogous to, and in others in contrast with, the congenital, original, or primary imbecility of the young, is the secondary imbecility of the old, what is tech-

[1] 'Philosophy of Insanity,' p. 47.

nically known in its highest degree as *senile dementia*. In age, in the lower animals as in man, mental decay or degeneration accompanies *pari passu* physical disability. Loss of memory, of will, of intelligence, accompany loss of muscular vigour, and a vegetative life results. But this senile imbecility or dementia is seldom seen except in domestic pets, such as dogs, cats, horses or ponies, and parrots, which are occasionally allowed to die a natural death.

It is important to note here that the *pathological bases* of senile dementia in the dog and in man are alike. Not only are the symptoms the same in kind, but the structural cerebral lesions, on which they depend, or with which at all events they are associated, also present a remarkable similarity in the two classes of cases. Thus Dr. Major tells us that the symptoms in the dog 'present in some respects a remarkable similarity with those of the analogous condition in man,' being in both cases referable to a condition of atrophy of the 'cerebral hemispheres and degeneration of those nerve-elements which form their most important constituents.'[1] I have no doubt that when other forms of mental defect or derangement in the lower animals are compared in an equally careful way with the corresponding conditions in man, not only the symptoms but the pathological lesions and conditions will be found in other cases equally wonderfully alike.

Dementia, however, in its different degrees between slight weakness or want of intelligence, and absolute non-intelligence or fatuity, is not confined to the periods of youth or age. It is liable to occur at all stages of life, sometimes in an acute, rapidly-developed form, but more usually it is gradually developed as the termination of, or *sequel* to, other more acute forms of insanity, especially mania and melancholia. Pierquin describes dementia —

1. In the horse, from passion, blows on the head, disease of the brain or its membranes;

2. In the mule, from acute encephalitis; and

3. In the cat from fright.

Arboval too speaks of it as following passion, bad usage, blows

[1] 'Wakefield Reports,' vol. v. p. 161.

on the head, apoplexy, and cerebral disturbance of any kind; while Franconi alludes to it as the result of an acute cerebral affection in the horse.

Broderip mentions senile dementia as taking the form of a kind of lethargy in the *parrot*. In that animal—in talking animals in general—this and other forms of insanity are marked occasionally by *incoherence* of speech, as well as by that tendency to excessive garrulity or loquacity, to useless and tiresome repetition of words or phrases, the result perhaps partly of loss of memory, that is so characteristic also of senility in man. The mental disorders that occur in *middle life* in the lower animals, as in man, are characterised generally either by—

1. General *excitement*, intensity and peculiarity of action.
2. *Depression*, with unnatural lack of action.
3. The development of *delusions*, especially of fear; or of
4. *Morbid impulses* and propensities.

Of the first group the commonest form is *mania*, which has long been familiar under the terms madness, frenzy, franticness, fury, ferocity, furiosity, or infuriation. It has hitherto been erroneously assigned, as a mere secondary condition, by various veterinary authors, to arachnoiditis, cephalitis, phrenitis, or other acute inflammations of the brain or its membranes. No doubt it is true that mental excitement of a maniacal character, sometimes or generally, accompanies these local disorders both in man and other animals. But in other animals, as in man, these cerebral or meningeal inflammations are comparatively rare, while mania in both is comparatively common, and in both, too, it presents the same general characters.

Mania is commonly known in its suddenly-developed, ephemeral, *acute* form, for the simple reason that it is never allowed by man to become chronic. The furious, dangerous, maniacal animal—and, unfortunately, also the animal which is merely supposed to be so—is shot, or otherwise destroyed as summarily as possible. But mania is sometimes seen in a *chronic* form in wild animals. Thus Baker describes what appears to have been chronic mania in a bull hippopotamus, of which he says: 'I never witnessed such determined and

unprovoked fury as was exhibited by this animal. He appeared to be raving mad. His body was a mass of frightful scars, the result of continual conflicts with bulls of his own species. . . . . He was evidently a character of the worst description, but whose madness rendered him callous to all punishment.'

Similar cases of chronic mania, or perhaps, rather, of what is more properly merely *recurrent*, or periodic mania, are even more familiar in rogue elephants on the rampage in India than in the great river horse of the Nile and its tributaries. In our own country the most usual instances of *ephemeral mania*, and of the dangers to man which characterise it, are cases of infuriated cattle, while being driven through the streets of large towns to market, running a-muck, a procedure strictly analogous to that which is so well known among the Malays. The newspapers teem with accounts of such cases in consequence of the disasters or panics which they produce, the truthfulness of the main facts being generally capable of easy substantiation.

A case of acute mania in a young short-horn bull at Ellon (Aberdeenshire) is thus described in the newspapers. First it became 'rather wild,' broke from its keeper and tossed a man, 'against whom it rushed with full force.' Then 'the infuriated bull got wilder . . . . and rushed madly against a stone dyke, breaking off one of its horns close by the head. The blood from the root of the broken horn squirted on to the dyke. On seeing it the animal got more furious than ever and rushed again and again at the blood-marks, literally smashing its head and almost killing itself.'[1] As usual in such cases, it was summarily despatched by the nearest butcher.

In all kinds and degrees of mania there is a tendency to continuous or intermittent fury or destructiveness, directed indiscriminately against all objects, persons, or other animals with which the affected animal may come in contact, or which it may see or hear. A murderous impulse is frequently exhibited, in which case the mental disease may be described as amounting to, or constituting, a *murderous* mania,

[1] 'Edinburgh Courant,' March 24, 1876.

exactly analogous to some forms at least of the homicidal mania of man.

Again, in paroxysms of maniacal fury, *self-injury* to the extent of fracture of the skull has happened in the horse (Pierquin) and elephant (Buffon), while other minor forms of self-mutilation are common. *Self-destruction*, too, in the form of accidental suicide in various ways, may, with various forms of self-mutilation, of self-inflicted physical disability from injury, be quite as serious to man, from the loss of valuable stock, as the destructiveness of human life and human property. The latter, however—for instance from the maniacal rogue elephant on its rampage—the loss of man's life, of his crops and dwellings, is sometimes very serious in a single limited district, and as the fruit of the morbid and wholesale destructiveness of a single animal.

As in man, mania is frequently merely exaggerated *passion*, or the result thereof. Thus Maudsley mentions fatal mania as the culmination of irritability and anger in the mandrill. Though melancholia is a much more usual sequel, mania sometimes results from grief in the elephant and other animals. According to Pierquin, grief is a common cause of it in the dog. Youatt describes it as arising from worms in the dog, and it is frequently produced by insect-plagues in the ox, horse, and other animals, for instance, by the mosquito, tsetse, bot-fly, gad-fly, and other flies.

Puerperal mania occurs sometimes after parturition in female animals, just as among women. Its ferocity in its puerperally mad state leads the sow sometimes to make murderous assaults on man. But a more frequent, if less unfortunate, result is, as in woman, the tendency to *infanticide*, to the destruction of the new-born young—a phenomenon not confined to the sow, but exhibited also by the badger, ferret, guinea-pig, hedgehog, brown bear, hamster, rabbit, and other animals.

In the mania of other animals, as of man, there is frequently, if not generally, a development of unnatural and spurious *strength*, succeeded by corresponding nervous and muscular exhaustion.

Of mental disorders specially characterised by *depression*

the most familiar is *melancholia*, which is quite as common as mania. Just as mania is frequently an exaggerated anger, or the result thereof, so melancholia is generally an exaggerated *grief*, or its direct sequel. Grief and sorrow, in all their degrees, with their culmination in melancholia, are extremely common as the result of *bereavements*—the loss of master or mistress, mate or companion, or even their mere temporary absence—the loss, above all, of young. Melancholia is common also in solitary animals, from the want of companionship or society; and in captive animals—especially monkeys—in whom it is probably associated with incipient or advanced tubercular pulmonary disease (Baird). Varying in profoundness or intensity, it is, as in man, or rather in woman, a frequent result also of *disappointed love* (Pierquin).

One of the many kinds of melancholia is important as illustrating a series of conditions that are sometimes causes, sometimes forms of insanity, viz. *nostalgia*, or home-sickness. It is most apt to occur in animals that show a strong natural attachment to their home, their place of birth or up-bringing —such as the cat, and even the dog—whose affection for persons is supposed to be much stronger than for places. Some dogs are as decidedly and morbidly *home-sick* as others are love-sick, the victims of erotomania, or sexual insanity. In these animals the home feeling is sometimes so strong that attachment to a new master or abode becomes impossible, a circumstance that is known to, and taken advantage of by, the dog-stealers. According to Pierquin, nostalgia sometimes accompanies grave cerebral lesion, in which case it is to be regarded as secondary and symptomatic—as a result, therefore, of disease. In other cases it would appear to be a form or kind, and in others a cause rather, of melancholia. Dejection, despondency, depression of spirits, is a common effect of removal from their native forests of various monkeys —such as the Titi (Cassell). But it does not appear that such mental depression is of the nature of nostalgia. It is more probably the mental accompaniment of serious or morbid physical change.

Certain animals have been described as possessing a natural proneness or *predisposition* to melancholia, as having a

melancholy temperament or disposition, as habitually and naturally sad or morose. Thus the loris and certain monkeys bear such a character (Cassell and Baird), and the orang (Huxley). The probability, however, is that the animals so described have all been menagerie captives, and that this supposed natural melancholy was, on the contrary, morbid, and the result of confinement and the artificial, unhealthy conditions incident thereto.

The *morbid impulse* most usually developed in the course or as the result of melancholia is not the murder of other animals or of man, the destruction of other lives, but *suicide*, self-destruction, a subject, however, to which I have devoted a special chapter. Morbid impulse is thus a common characteristic both of mania and melancholia—usually in the form of destructiveness in both cases; in the one, however, the destructiveness being active, involving the life and property of others; in the other rather passive, leading to the sacrifice —not necessarily intentional or deliberate—of the animal's own life. In both classes of cases, however, the morbid propensity occupies a secondary importance, as regards, at least, sequence, to the mental excitement or depression.

But there is a third group of mental disorders in which the development of certain morbid propensities is a more marked feature than either mental excitement or depression, in which, indeed, neither excitement nor depression may be present, or at least apparent; in which, in other words, morbid impulse is the primary condition in the sense that it is at least the most prominent and important one. In man the most familiar members of the group in question are—

1. *Erotomania*, or sexual insanity.
2. *Kleptomania*, or theftuous insanity; and
3. *Dipsomania*, or drinking insanity.

All these kinds of insanity occur in one form or other among the lower animals.

Erotomania occurs, as in man, in the double form of *satyriasis* in the male, and *nymphomania* in the female. It would appear to be most common in *female* animals, especially the mare, cow, bitch and cat. Sometimes nymphomania is spoken of under the term uterine furor; or this periodical

erethism in the mare or other female animals passes into, if it do not in itself amount to, what is technically known as nymphomania. Occasionally nymphomania and hysteria are confounded with, or mistaken for, each other; or equally probably the two are associated in the same individual at the same time (Pierquin). Satyriasis in the *male* dog has been described by Hildebrandt, in the male mandrill and horse by Pierquin.

The latter author speaks of nymphomania in the female ape, and points out that among its other dangers or disabilities in the mare and cow, it leads frequently to abortion. He mentions what he calls erotic delirium in a menagerie elephant, and amorous or erotic melancholia—which is obviously what other writers describe as literally the 'consuming passion' of unrequited or ungratified love—a bodily consumption, waste or decline, a fatal marasmus, resulting from a purely moral cause, in female animals, especially mares.

Erotomania is perhaps most familiar in animals of the deer family at the period of the rut. But it occurs in a great variety of other animals, especially cattle, horses, dogs and cats, usually as the result of over-gratification or non-gratification of the sexual instinct. It may be induced, however, by a considerable variety of other causes. Thus it has been described as occurring in a monkey as the result of fear, caused by an eclipse of the moon; and it is an accompaniment of *phthisis pulmonalis* in the monkey and rabbit (Pierquin). On the other hand, it may be simply an exaggerated libidinousness or a morbid salacity. It may be acute and suddenly developed, sometimes markedly so in the satyriasis of the horse, or it becomes chronic and habitual, or breaks out only now and then.

The term *erotomania*, whether as applied to man or other animals, is misleading, in so far as it is apt to suggest the idea that furiosity is a necessary feature of the disease. So far is this from being the case, that, as we have already seen, the form the disorder assumes, when most serious in its results, is melancholia. Erotic insanity would therefore be a better term, as more comprehensive and less misleading. This erotic insanity, however, is more frequently accom-

panied by furiosity and combativeness than by inertness and mental depression; and it may pass into ordinary mania of the most furious, and even of the murderous, type (Pierquin). Thus there is not unfrequently an unexpected and dangerous outbreak in harness, on the part either of horses or mares, in which case there is imminent risk of the animals running off at a bolt and smashing the carriage, or of their running at full speed to the point of falling from sheer exhaustion.

Pierquin goes so far as to describe the annual spring *rut* of certain animals as a periodic insanity, characterised by an irrestrainable tendency to furiosity—as, in fact, a kind of true mania. But this is going too far, although the physiological condition in question is apt to become pathological, the pugnacity and temper that characterise it apt to pass beyond the bounds of control and to acquire a morbid intensity. In such a case, when the ferocity and pugnacity become somewhat chronic, and when they are uncontrollable by the will, the condition may be fairly considered *morbid*, and relegated to the category of insanity—just as much as unbearable, ungovernable, and dangerous ferocity of temper in the horse and other animals may also be. Not only, however, is the rut accompanied usually by a dangerous kind and degree of mental excitement, which is apt to pass into common mania or erotomania, but in the bitch, for instance, it is no infrequent cause of rabies (Fleming).

Just as in man, *theft* occurs among other animals as a misdemeanour, vice, or crime, in which case the motive is obvious, the propensity corrigible, and the article stolen of use to the thief. But there also exists, both in other animals and man, a morbid or insane impulse or propensity to steal, which in man is described as *kleptomania*, and which is distinguished from ordinary theft by—

1. The absence of conceivable motive.
2. Incorrigibility under reproof or correction; and
3. The utter uselessness, perhaps also valuelessness, of the objects stolen.

In ordinary or natural *theft* the objects of the animal's envy or covetousness are usually articles of food, and are at once used as such, or are stored for future use. The hungry

or starving dog or cat steals a piece of meat and forthwith devours it. But in theft of the character that is to be considered *morbid*, the objects purloined are of the most heterogeneous and useless nature, bright metallic substances perhaps predominating. Instead of being applied to any intelligible purpose, these miscellaneous articles are piled up in hidden hoards, to which the only parallel is the collection and concealment of equally miscellaneous and useless heaps of rubbish by the human kleptomaniac—heaps and hoards that are common in every large hospital for the insane. Instances may be found recorded in 'Excelsior,' a little serial issued for the last twenty-one years from the Murray Royal Institution for the insane, near Perth.[1]

Such hoards of animals or men are not to be confounded with what may be called the 'kitchen-middens' of cave carnivora, or of harvesting ants, which in the latter case serve as guides to the nests of ant colonies. Still less are they to be confounded with grain, seeds, fruits, or other articles carefully stored away in quantities during summer for winter's consumption.

Kleptomania would appear to be a family failing of the magpies. They have at least an evil reputation for inveterate theft (Baird). The Australian magpie steals, hides, and hoards the most heterogeneous articles (Baden Powell), just as its British representative does.

Rats are notorious as incurable thieves, purloining and secreting in hoards—in their nests—coins and other indigestible and heterogeneous articles. Many a discovery of long-lost articles, many a hoard of once shining objects, has been found in a rat's nest on dismantling a house or making repairs on its floors or walls (Eassie).

The jackdaw, raven—even the monkey, dog, and cat sometimes—steal and hide spoons, buttons, toothbrushes, and other articles that are utterly useless to them, and of which they never attempt to make any use. They steal and hide apparently simply on account of the pleasure they derive from theft and the accumulation of property. Theft in them appears to be in a sense involuntary; they cannot resist the

[1] *E.g.* in No. 32 for 1872, p. 7, and in Nos. 23-5 for 1866, p. 8.

morbid impulse; they steal in spite of, and undeterred by, any kind of punishment. The only difficulty in regarding these apparently motiveless eccentricities of theftuous abstraction and concealment as forms of insanity—in other words, as equivalent to man's kleptomania—is, that the propensity seems to be a moral characteristic of certain *species* or even genera, while, as in the case of the Tasmanian devil and other animals, which, as species, are said to possess peculiarities of temper, it is contrary to all analogy to regard such normal and specific characteristics as belonging to the category of *insanity*.

Where, however, any such morbid propensity is developed in an animal whose natural character formerly led it to act in an opposite way—where an animal that was formerly honest cannot resist the propensity to steal trash, articles utterly useless to it, and where the only result to it can be severe punishment—there can be no difficulty in setting this kind of theft down to the credit of *kleptomania*, as it occurs in man. Just as in man, however, in cases of persistent theft of an incorrigible kind, close observation and much reflection may be required to determine whether or not it is uncontrollable and purposeless—in other words, the result of disease and in itself morbid.

The subject of *theft*, morbid and natural, is treated at greater length in the chapter on 'Crime and Criminality.'

That *dipsomania*—a morbid craving for alcoholic or other stimulants, or something akin thereto—occurs among the lower animals, is shown in the chapter on 'Alcoholic Intoxication.'

Erotomania, kleptomania, and dipsomania in man, are classed as forms of what is termed *moral insanity*. But there are among the lower animals certain other forms of moral defect, perversion, depravity, or insanity—loss of moral self-control or equilibrium—which have their exact counterparts in the human subject. Thus there are many individuals among such animals as the dog and horse that are incorrigibly vicious, or that have most uncertain or most peculiar tempers, or that show no natural affection, or that display morbid antipathies to their nearest relatives, or to those kindest to

them; who repay attention with ferocity or indifference, or whose character is made up of a combination of bad qualities. The human parallel to these unfortunate animals is a class familiar to the physician engaged in lunacy practice—a class made up largely of youths who are the *bêtes noires*—the black sheep, the ne'er-do-wells of their families, the heart-breaks of their parents, the shame of their friends—given to lying, theft, drink, indolence, or debauchery, or to all of them; incorrigibly vicious in short, utterly unfit to occupy or maintain a respectable or self-supporting position in the world. Such human waifs are, or should be, pitied, not punished; they are, or should be, dealt with gently as not themselves to blame for a faulty moral organisation.

It is scarcely surprising that the *incorrigibility* of moral defect or perversion in other animals is utterly misunderstood by man. The most mischievous attempts are constantly made to 'drive the devil out of them' by cruelties the most refined. The supposed mere *vice*—an hereditary vice, however, of organisation—becomes more and more serious, and the animal more and more useless or dangerous, more burdensome and troublesome, until its career is put an end to by the gun, the pole-axe, or poison.

Morbid or exaggerated self-esteem—amounting to what in man is called the *monomania of pride*—what Pierquin terms a monomania of ambition, is common according to him in Arab horses, fallow deer, and apes. The kind of ambition, however, to which in some cases at least he applies the term 'monomania,' can scarcely be regarded as morbid in its nature. It is, in fact, a mere natural desire for leadership, which urges the horse, for instance, to attack other animals of superior rank, and carrying the costume or badge thereof.

Morbid or exaggerated alarm or timidity, amounting to what is called in man the *monomania of fear*, is indubitably much more common than the morbid exaltation of self-esteem, pride, or vanity. Morbid fear is apt to be associated with, or to give rise to, *delusions* of fear or suspicion, and to melancholia, sometimes even to suicide. The relation of fear to *suspicion* or suspiciousness, and to *delusion*, is most important in relation to the genesis and development of a whole

group of common morbid mental phenomena. Fear is at all times, and especially in naturally timorous animals, in association with *imagination*, apt to exaggerate the kind or degree of threatened danger from things, persons, or other animals, or to create ideas of evil where no real danger or cause thereof exists.

In many of the wild carnivora, for instance—especially perhaps in the wolf and fox—fear frequently passes into suspicion, and the latter into delusion, as one of the results of man's incessant persecution. Distrustfulness, arising in, or consisting virtually of, an excess of caution, is common in animals persecuted by snares—such as the glutton (or wolverene)—which has very good grounds or reasons for its distrust or caution. But such distrust is always apt, in animals so hunted by man, and rendered so preternaturally alive to the many forms in which danger may present itself and to the necessity for avoiding all kinds of compassing perils, to become morbid, and to be developed without sufficient grounds, or absolutely without external grounds at all. In short, the dread of danger is liable to become excessive, while a morbid suspiciousness is apt to beget imaginary evils.

What, in its first stage, may be set down to mere natural timidity, may become, in its second, a morbid terror or dread of one specific object, sound or sight, or of a very limited number of such objects, sounds or sights, and in the third a veritable *panphobia*—a general and causeless dread of everything—of every animal and person that is not quite familiar to the affected animal. This indiscriminate kind of alarm is most commonly met with in the horse, though it is apt to be developed in all animals that are constitutionally timorous and nervous, that are easily startled by the most trivial causes. It is frequently due to or associated with sensorial defect or perversion, such as lesions of sight and hearing.

It may arise then either entirely—

1. From an internal cause; or—

2. From one that is, in the first instance at least, external; or—

3. From conjoint internal and external causes, sometimes the one cause, sometimes the other taking the precedence.

In its minor degree it is familiar in the form of skittishness.

In all cases *imagination* is highly excited, and it exaggerates, while the reason misinterprets, all impressions on the senses. Panphobia, in common with all other forms of morbid fear, is easily induced by cruel, unjust, or injudicious usage, especially if incessant or prolonged, and this usage may have been applied to an ancestor, rather than to the individual, the mental tendency having been transmitted hereditarily. Sometimes it is suddenly developed from unexpected sounds or sights, by seeing or hearing without premonition any unusual or novel, though perfectly harmless, object or noise. In such cases the result may be the extreme wildness of terror, which may pass at once into reckless dangerous fury, which again may lead to suicide or self-destruction. Among other possible terminations of panphobia of such intensity is dementia, with or without emaciation or convulsions, which latter may, or may not, be fatal.

In general terms it may be said that all the *passions* or *emotions* may be so intensified, and so protracted or persistent as to become, or to generate forms of what in man are called monomania, *moral insanity*, mania and melancholia (Pierquin). Such passions or emotions are particularly grief and joy, rivalry, jealousy and revenge.

Certain authors speak, and with perfect propriety, of *impulsive* insanity in the lower animals. That is to say, a desire of a powerful, imperious or overmastering kind, one that is uncontrollable, ungovernable, irresistible, suddenly arises, and it is instantly followed by action. Both the desire and the action may appear so unexpectedly, and occupy so small a space of time, that they seem to be quite momentary or transient. After the act, or action, the animal subsides into its previous condition. Whether the desire or mental action is associated with morbid idea or delusion we know not. Both desire and action are, so far as we can see, independent of, or uninfluenced by, external cause, or by provocation of any kind.

The *morbid impulse* takes the direction usually, or frequently, of *destructiveness* or ferocity, a thirst for the destruc-

tion of life, and it is sometimes so intense as to culminate in murderous or homicidal mania, or less commonly, in suicidal melancholia. Impulsive ferocity of a dangerous kind is frequent, for instance, among menagerie carnivora.

What may be considered a natural *impulsiveness* sometimes leads to acts of so serious a character as murder, or to others of a minor kind, regretted by the animal in its calmer moments. Passion, for the moment, overcomes judgment and good-feeling, even in naturally well-behaved animals: anger gets beyond control of the will, and hurries them into some most undeliberate, unintended act of revenge or punishment.

No doubt impulse—natural or morbid—is the basis of much *eccentricity* of conduct that is otherwise unintelligible, or inexplicable (Pierquin). We speak, then, correctly of impulses in animals, of a good or bad impulse—to virtue or vice, to right or wrong action. It is *impulse* that almost invariably regulates or determines the action of masses devoid of organisation—whether these masses be human—witness the various revolutions in Paris, or animal—witness the frequent stampedes of cavalry horses. But, as in man, these impulses can generally be, and are, regulated and restrained by the judgment and the *will*, and it is only when they pass, by reason of their intensity, duration or other characters, beyond, and defy, such control, that they are to be regarded as morbid and referable to the category of moral or *volitional insanity*.

Certain forms of insanity in man have been described as *volitional*, the main characteristics of which are morbid *will*, morbid either in its defectiveness, perversion, or exaltation. In the lower animals, as in man, the power or force of will is shown in every degree—of feebleness or strength—in vacillation or helplessness, or in the utmost determination of purpose. As in man, the weaker will constantly becomes subservient to the stronger, so that one animal becomes obedient to another, just as the dog and horse become submissive to man. It is by force of will that one animal subjects another to its service: as the ape does in riding the pig or dog, or the ant in milking aphides.

Enfeeblement of will occurs from fatigue of body, want of sleep, hunger and thirst, excessive heat or cold, in short, from all kinds of bodily privations or sufferings (Houzeau). And it is a usual concomitant of many forms of insanity—especially those—such as imbecility, juvenile or senile—which are characterised by *defective* mental action.

It has already been shown, moreover, that the presence or absence of *will*, of the power of control by its means, determines frequently the question of insanity. There is an obvious difference, however, which must always be borne in mind, between feeling or emotion, which in its intensity or nature is *uncontrollable* by any effort of will, and that which is simply *uncontrolled*, though controllable. In the one case, mental disorder or defect presumably exists, involving *irresponsibility* and rendering punishment useless; while in the other there may be perfect mental health with corresponding responsibility, and punishment may be not only permissible, but desirable; for in other animals, as in man, the power of will may be developed, and it may be directed into proper channels, by suitable education.

It has thus been shown—and it may be said, in general terms—that the lower animals, or certain of them, are subject to nearly all the forms of insanity that afflict man, by whatever names these forms may be designated: affective, instinctive, emotional, volitional, impulsive, moral, as well as intellectual, the insanity of thought as well as of feeling and action.

The *insanity of thought* involves delusion—an important subject to which a special chapter has been devoted, and it includes even, in the parrot and other talking animals, *insanity of speech* or language. The latter again implies verbal incoherence, rambling or repetition of words and phrases, and of the ideas which they represent: there is, in short, utter confusion in the verbal expression of ideas.

CHAPTER V.

PERVERSIONS OF THE NATURAL AFFECTIONS.

THE various perversions of the natural affections that are so common among the lower animals, as in man, form a very interesting and natural group of the minor forms of moral defect or disorder.

Of these perversions of affection, the commonest and most familiar is perversion of the *maternal* instinct, of ordinary maternal love. It exhibits itself in the following forms or degrees:—

1. Selfishness.
2. Indifference to offspring.
3. Active hatred or dislike.
4. Cruelty.
5. Neglect.
6. Desertion.
7. Murder of the young, equivalent to infanticide.

Affection for the young is usually predominant in the *female* of all animals, including man; so that any want of this natural love is more conspicuous in her than in the male. There are, however, many exceptions to the steadiness or constancy of maternal attachment.

In illustration of mere maternal *selfishness*, Berkeley states of certain wild ducks cooped up with their young, that some 'flew at, and beat themselves against the bars of the coops, frightening and trampling to death their own young.' They 'resisted detention even to forgetfulness of their young.' But it is doubtful in such a case whether the poor mothers were chargeable even with the crime of neglect or carelessness of their young. In all probability they were

so terrified, no less on their own account than on that of their offspring, that they were virtually irresponsible in every sense for the calamity narrated. A common form of selfishness is devolving maternal duties on others. Certain birds, for instance the cuckoo and yellow warbler, do not rear their own young.

As illustrating other forms of *neglect*, Mrs. Mackellar tells us of a hedgehog that neglected certain of its young brood 'so that they died,' after eating two of them. But this was on board ship—a few days after capture—in other words, under circumstances that were exceptional, or unusual.

Instead of the ordinary attention to their young there is sometimes marked *indifference*, e.g., in the cow, mare, bitch, and pigeon. *Indifference* may be shown only at the loss of young, which is remarkable chiefly when contrasted with the violent demonstrations of grief, so common, for instance, in the dog under the same circumstances.

Many forms of *cruelty* are also common, but none so much so as murder and *cannibalism*—especially the devouring of their own young by mothers, usually in the puerperal state. Indeed, this kind of *infanticide* is one of the usual indications and concomitants of recent maternity, and in modified forms this unnatural treatment of her own offspring is as characteristic of the human female as of the female of certain other animals, in the puerperal condition. Sometimes there is an immediate or exciting cause, which, however, may be of the most nominal kind. At other times there is no apparent cause for what is obviously a morbid appetite or impulse, determined by the puerperal state.

The most trifling circumstances sometimes cause mothers to devour their offspring, e.g., in the dog and cat, as well as in swine. Infanticidal mothers occur also among several of the gallinaceæ (birds) and in the ouistiti monkey (Houzeau). Any disturbance of whatever kind of the female or her surroundings, while she is in the highly excitable, morbid condition that succeeds parturition for a time, may precipitate or produce destruction and cannibalism of the young. The mere sight of her young in the female emu

begets an excitement of a dangerous character that leads, on the one hand, to a morbid impulse to destroy them, and on the other, to conjugal quarrels in consequence of the protective resistance of her mate (Darwin). There is sometimes an unfortunate *rivalry* between a mother cat and her own unoffending and unconscious kittens in the good graces of their mistress, and the result involves, in the case of a greater favour being shown to them than to the mother cat herself, her tormenting by biting them, or otherwise, and finally killing them by exposure to the cold, or other means. The ouistiti monkey again bruises her young against trees when tired of them (Houzeau).

Aversion to her own young, in the cat, sometimes amounts to a very marked abhorrence or detestation, the very sight of them causing shuddering and fear. Fixed or rooted *hatred* to the young leads sometimes to infanticide (Pierquin).

Desertion of the young in various stages of their growth, from the egg upwards, occurs in several birds, such as the cuckoo, raven, swallow, and the house martin, as well as in the marmozet (monkey) and other animals. Swallows and house martins leave their offspring to perish in the deserted nests, whenever the period for migration arrives (Darwin). In other words, the migratory would here appear to be stronger than the maternal instinct. The desertion of her eggs by the cuckoo is a very familiar fact (Baird), and the result of the abandonment of their young, by swallows—the death of the former by cold and inanition in winter or earlier, are equally well known (Houzeau). The crocodile, ostrich, and other animals, also abandon their eggs.

There is sometimes a total absence of *regret*, or any other natural feeling in the desertion of young (Pierquin).

In addition to permanent *deficiency* of maternal love, there are also singular *revulsions*, or waves of feeling—ebbing and flowing tides of affection—coldness being succeeded by fervour, or *vice versâ* (Gall).

If, however, there are *unnatural mothers*, there are also unnatural fathers in whom there is perversion of the *paternal* feelings or affections. It is one of what we may believe to

be the awkward and unwelcome duties of the mother sometimes to defend her progeny against the morbid voracity—the cannibalism of their own father—for instance in the pig. The male sow is a notorious cannibal. The female bee, too, has to protect her young against the cannibalism of their own father. There is a paternal indifference to the young among male ruminants, solipeds and pachyderms.

Marital affection becomes transformed sometimes, as in man, into marital ill-usage, and there is no reason to doubt that the 'hen-pecked husband' is no figure of speech among the lower animals. We read of the marital ill-usage of a wife by a monkey, who first decoyed, and then drowned her—that is, committed murder (Cassell).

Conjugal quarrels are by no means confined to man. Conjugal indifference is, in fact, a characteristic of polygamous birds (Houzeau). Perversions of the *parental* feelings occur, therefore, in either, or both, parents, though most frequently, apparently, in the female.

Filial love is equally wanting sometimes (Houzeau). We are told, for instance, of dog-pups biting their own mother (Gall). But this may arise from mere temper or irritation, as well as from the irritability or indifference of disease.

The young of most animals soon acquire a sense of independence of their parents, and they display no regret at leaving them. But it may be reckoned a perversion of *filial* love, or affection, when selfishness leads them to show no pity or compunction in robbing these parents of food, in becoming their competitors in the struggle for life, a competition that gives rise to unseemly combats between parents and offspring for supremacy, or for food (Houzeau).

The most common perversion of *fraternal* or brotherly love is the capriciousness, or inconstancy, of attachments, companionships, or friendships—whether between different individuals of a species, or between members of different species or genera. The same kind of caprice, or *fickleness*, characterises attachments to (1) man, (2) places, and (3) things. The ready attachment of some dogs to new human friends is familiar, as is also the sometimes rapid, easy and unaccountable *transfer* of affections in their own companion-

ships. The rupture of attachments, again, is frequently not felt, especially by the young.

Other forms of perversion of fraternal affection are to be found in—

1. Ferocity to each other—for instance, of dogs to strangers of their own species in the East.

2. Cruelty—including all forms of persecution.

3. Cannibalism—as in the case of dogs in the East, killing and eating disabled companions (Cobbe and Low).

4. Desertion, forsaking, of these wounded fellows sometimes occurs, instead of cannibalism,—the latter being determined probably by feelings—painful, or comfortable—of hunger or satiety.

Further and fuller illustrations of the more serious perversions of the natural instincts, affections, or passions, are to be found in the chapters on (1) 'Suicide and Murder,' (2) 'The Forms of Insanity,' (3) 'Mental Defect and Derangement,' and (4) 'Foster Parentage.'

CHAPTER VI.

ARTIFICIAL INSANITY.

THE subject of artificial insanity—that which is producible at will by man in other animals—is one of much importance, no less in relation to—

1. Our knowledge of the genesis, development, and treatment of *human insanity*, than to

2. The various forms of *preventible* cruelty to animals; and the correspondingly

3. Varying kinds and degrees of man's *responsibility* for their usage.

By means quite at his control, to begin with at least, man can produce in other animals, or certain of them, special mental lesions—defects or diseases—whose course he can regulate, so that he can deliberately study the etiology and cure of such lesions, their origin and whole progress or course. He can generate several forms of insanity, and all degrees of these forms; and they may be rendered permanent, dangerous, even fatal, or trivial and temporary, according to his purpose. Though the immediate or exciting *cause* in such cases is wholly within man's control, the *results* are not, however, always or altogether capable of his regulation. Sometimes the latter are equally unlooked and unhoped for, neither desired nor desirable.

Thus artificially induced mania is said occasionally to lead to the undesirable and unfortunate result of suicide (Pierquin). In proportion as the cause is simple and single, and directly applied, the result tends to become equally simple. But there are so many modifying influences, partly unknown to the experimenter, that it is difficult or impossible to control them,

so that the exact issue cannot safely or certainly in any case be predicated. Thus the same toxic agent does not always or necessarily produce the same effect in the same species, or even in the same individual under diverse circumstances. There may be exaltation or depression, or the exhibition or not of this or that special propensity or passion.

There are, fortunately or unfortunately as the issue may prove in individual cases, various means of artificially producing different kinds or forms of mental defect or disturbance in the lower animals, including especially—

1. *Experimental* excitation—chemical, mechanical, or electrical—of or in the brain, that is, by the imitation of pathological conditions (Broussais, Pierquin, Gudden, Ferrier).

2. Drugging with narcotic or other poisons, or the inhalation of narcotic or other gases, or of irritant particles diffused through the air; in other words, the production of toxic insanity or toxico-mania.

3. Provocation of various kinds and to various degrees, including—

   a. The persistent exhibition of hated or loved persons, animals, or things.

   b. The employment of obnoxious sounds—as of music; colours—as red; or sights—as of unfamiliar and terrifying objects.

4. Cruelty in many other forms, including—

   a. The use of the goad, spur, whip, or other means of producing spurious courage—that of desperation—in the various sports of man.

   b. The use of other objectionable instruments or appliances.

   c. Starvation.

   d. The 'hue and cry' after strayed starved dogs or bewildered footsore cattle.

   e. The infliction of injury or wound.

Of all these various forms of artificially creating mental disturbance in some of its degrees, that which is at once the most common, the most disgusting, and the least defensible, is the infuriation, maddening, furiosity or ferocity produced in animals made to fight for man's diversion.

One of the best known of the 'special correspondents' of the London Press—Archibald Forbes, of the 'Daily News,'—who accompanied the Prince of Wales in his Indian tour in 1875-6, speaking of the Baroda sports and of the arena fighting of wild buffaloes, thus describes the suffering that must have resulted from the loss of a horn close to the scalp. 'The agony must be horrible. The blood streams from the raw pith on to the sand. But the fighting demon is rampant . . . . . and he battles madly on. . . . . Dashing blindly against the barricade, he half staggers, half crouches under it. . . . . Mad with pain and terror, he rushes out into the open, the scared populace flying wildly from his infuriated track.'[1] Referring to the same royal 'sports' the 'Saturday Review'[2] commented on the fact that elephants were 'tortured into ferocity in order to gratify a craving for excitement' in the highest representative of the educated Englishman, for the benefit of England's future king! The reviewer very properly characterises these beast-fights as 'odious and repulsive exhibitions.'

The bull-fights of Spain and the dog-fights of England are other and more familiar examples of the literal goading or torturing into fury of various genera and species of animals merely for man's enjoyment.

We read of the

> Young and savage Bull by salt and goading maddened

in the modern Spanish arena; while in the Coliseum of ancient Rome red-hot goads, whips, or other instrumental tortures, as well as starvation and the display of obnoxious colours, were all used in the production of the desired ferocity.

Quite as familiar in the streets of all our towns, though having its origin more in ignorance probably than in wanton cruelty, is the *infuriation* of runaway dogs or oxen by the rough persecution of the hue and cry 'mad.' The poor unfortunate beast is hooted, chased, pelted, and at last driven to bay; and it is not surprising that a dangerous furiosity should be engendered in sheer self-defence.

Those forms or kinds of mental defect or derangement

[1] 'Athenæum,' December 18, 1875, p. 831. [2] In December 1875.

which are experimentally produced for the purposes of physiological and pathological study have at least the high aim of improving man's knowledge of the natural history and treatment of disease, mental and bodily. The comparative pathologist, physiologist, or psychologist cannot justly be accused either of ignorance or of wanton cruelty. All his experiments are determined by definite and humane purpose, though this purpose is not at all likely to be understood by the general public.

In certain animals *idiocy* can be easily produced by various artificial lesions of the cerebral substance. Thus the Swiss physiologist Gudden has proved that 'removal of the cerebral hemispheres of the young animal is followed by idiocy in the adult.' He found also that, when both eyes of a pigeon were enucleated soon after it was hatched, 'the bird grew up in a condition of idiocy.'[1] Dr. Fothergill, of London, informs us that 'in Dr. Ferrier's experiments on monkeys, irritation of the occipital lobes (of the brain) produced marked symptoms of *melancholia*.'[2]

Section of the sciatic nerve in the guinea-pig, according to Brown-Séquard, gives rise sometimes to 'loss of consciousness, and a state of torpor, stupidity, and even, in a few instances, *insanity* for a while, after the attack'—of convulsions produced or determined by tickling or gently pinching the skin.[3]

Ferrier found *rage* one of the results of electrical stimulation of the brain in some of the animals on which he experimented.

A great variety of morbid mental phenomena may be produced by the administration of *narcotic*, irritant, or other poisons—animal, vegetable, and mineral—in certain forms and doses, including the following:—

1. *In the solid or fluid state*—

   Alcohol.

   Chloral.

[1] 'Review of Recent Researches on the Physiology of the Nervous System, by Professor McKendrick, of Glasgow, 1874, pp. 34–5.

[2] 'British Medical Journal,' December 26, 1874, p. 817.

[3] 'Lancet,' January, 1875, p. 8.

Opium and its derivatives.
Cantharides.
Corrosive sublimate.
Henbane.
Stramonium (thorn apple).
Belladonna (deadly nightshade).
Dulcamara (bitter sweet).
Indian hemp ('bhang,' or 'haschisch').
Conium (common hemlock).
Hellebore.
Aconite (common wolfsbane or monkshood).
Tobacco.
Mandrake.
Lupuline and hop.
Euphorbium.
Valerian.
Catmint.
Asarabacca.
Manchineel.
Castoreum.
Turpentine.
Betel.
Chicory.
Gentian.

There are many other substances, mostly vegetable, that are less known than the foregoing, but which, according to Pierquin or other authors, produce similar mental effects when administered, to wit:—

European or common hemp.
Fenugreek.
Buckwheat.
Fool's parsley.
Virginian snake-root.
Darnel-grass.
Water hemlock or cowbane.
Bryony.
The Toot plant of New Zealand.[1]

[1] *Vide* what I have said on this subject in the 'British and Foreign Medico-Chirurgical Review' for July, 1865, and October, 1868.

2. *In the gaseous state*—

Carbonic acid.
Laughing gas (nitrous oxide).
Sulphuretted hydrogen (privy gas).
Chloroform-vapour.
Sulphurous acid.
Tobacco fumes.

The effects produced by these or other poisons, including temporary or permanent stupor or stupidity, necessarily vary with—

1. The nature of the drug or poison used.

2. Its dose, and the repetition, continuance, or intermittence of administration.

3. Its varying composition and freshness.

4. The diverse constitution of the animal operated on, including its idiosyncrasy (if any), as well as its genus and species.

Probably the most common form of *toxic* insanity now-a-days artificially produced is *alcoholic* intoxication. But the effects of alcoholic and other intoxicants on the lower animals are specially discussed in a separate chapter.

In bygone days *toxic* mania was produced for nefarious purposes, to aid the aims of the thief. At certain fairs in Normandy, we are told by Pierquin, it used to be the custom for horse thieves, by diffusing *cantharides or euphorbium* in the air, to produce in horses an epizootic panic. This led to a confusion among the owners of the horses and the attenders of the fair—a state of matters highly favourable to the objects of the ingenious but unscrupulous experimentalists. The substances here used would appear to have acted as *irritants* on the nostrils of the horses, and to have produced effects resembling those caused, for instance, by the bot or gadfly. The animals became indocile, restive, unmanageable; broke from their tethers or guardians and stampeded. And what is of importance to be borne in mind by all concerned in the custody of domestic animals, furiosity in the runaway horses was developed in proportion to the kind and amount of man's attempted interference with their freedom of movement. In other words, man's best policy would have been, or was, to

allow the panic-stricken animals to gallop off their nasal irritation and their epidemic alarm.

The creation of *panic* in any large body of highly nervous or timorous animals, such as the horse, is at all times as easy on man's part as it is, or may be, ruinous to his interests. Thus the North American Indians artificially produce stampedes in the prairie-feeding horses of settlers by causing them, in unreflecting imitation or imitativeness, to follow the false lead of their own (Indian) decoy horses—trained for the purpose—first, however, producing panic. The aim is the same as that of the Normandy panic-producer—horse-stealing.

Cantharides are also said to produce in some animals *erotomania*, or a morbid amorousness amounting thereto.

Opium, as might be expected, like alcohol, produces different effects in different animals, e.g. the rat, pig, and horse. Passion or anger, irritability or combativeness, are common results. But, on the other hand, it has been used as a sedative or *calmative* to repress or diminish ferocity in menagerie animals. Pierquin describes opium as capable of inducing, according to circumstances, simple joyous mania, erotomania, melancholia, or idiocy.

According to Belt, *corrosive sublimate* rendered certain leaf-cutting ants mad, 'so that they bit and destroyed each other.' Sprinkling it experimentally on their track, 'as soon as one of the ants touches the white powder, it commences to run about wildly, and to attack any other ant it comes across. In a couple of hours round balls of the ants will be found all biting each other, and numerous individuals will be seen bitten completely in two, whilst others have lost some of their legs or antennæ'—all by a sudden development of what must be regarded as a *murderous mania* or monomania.

Castoreum has an irresistible attraction for the beaver, causing it to 'squeal with fierce excitement' if it merely scent it. Hence it is used by hunters for baiting beaver-traps (Wood).

What may quite appropriately be described as *maternal* affection is producible in certain *male* animals, artificially and vicariously, for instance in the male castrated fowl, by

local external irritants (Cabanis). A factitious maternal instinct is thus created, which leads the animal to assume the duties of the female.

Intense mental irritation—sometimes amounting to mania—is producible by the injection of *turpentine* into the anus of dogs, an operation that is occasionally the result of a dangerous practical joke intentionally perpetrated by house painters. The poor animal becomes furious by 'turpentining:' it 'rushes about in the most frantic manner, howling and yelling, tearing up the ground, until its claws are worn to the quick, dashing hither and thither, and attacking its own body with its teeth, or flying at any animals, or persons in its track;' all this being the result, apparently, of the intolerable physical pain, produced by the local chemical irritant. What is most important to be borne in mind is, that 'the furious form of rabies is so closely simulated, that this turpentine mania has not unfrequently been mistaken for that terrible disease.'[1]

Pierquin suggests that the generic name of the *manchineel* plant—'hippomane'—is based on its power of producing *erotomania* in stallions and mares. The same author ascribes *melancholia* to *henbane*, and describes the effects of *belladonna* as similar to those of opium; and he speaks of *erotomania* as producible in certain birds, when fed upon *hemp* seed, *buckwheat*, or *fenugreek*, or by *cantharides*. But these and other statements of Pierquin's obviously require re-investigation, before they can be accepted as provable and proven facts.

All the plants, or their chief products, mentioned in the foregoing list, are represented as giving rise, in certain animals, to temporary *delirium*, or more permanent *mania*, according to the dose and the duration of subjection to the poisonous influence of repeated or continuous doses. The use of many of these plants was known in ancient times, and is recorded by classical writers. Thus fury was developed in cows, by causing them to eat poppies, and in cats, by eating cat mint (Pierquin). Certain *mineral* narcotics

[1] Review on Comparative Therapeutics in the 'British and Foreign Medico-Chirurgical Review' for April, 1874, pp. 405–6.

are said to produce effects similar to those of the vegetable ones (Chieraggi).

Mechanical injuries—such as *blows on the head*—are apt to produce the same kind of mental results as in man. And it need not be pointed out that the lower, and especially the domestic, animals—such as those like the horse, dog, ox, or sheep, which are the slaves of man, or minister to his daily wants, are much more liable to such injuries—too frequently wantonly inflicted—than is man himself. *Traumatic insanity* in them—mental disorder arising from various kinds of injury or wounds, most of them directly attributable to man's cruelty—is probably much more common than is generally supposed. It is apparently rare simply because it is not carefully looked for.

As has been explained in another chapter, man's practice, in such cases, is not to study the diseases—mental or physical—which he has himself created, but to thrust the animals affected with them as speedily and completely as possible beyond his view and ken, by the aid of his gun, bludgeon, the butcher's knife, or poison.

Traumatic insanity in the lower animals is sometimes described also, as 'accidental,' in the sense that it results from injury, or wound, produced by accident, not by deliberation or intention on man's part. It is not the less, however—both artificial and preventible—the fruit of man's ignorance, if not of his wantonness, at least in the majority of cases.

Unfortunately much of man's bad usage is apt to be directed to the *head* of his animal victim. The dog and other animals are often stunned by blows on the head at the hands of man; and these blows lead occasionally to *dementia*, preceded by anorexia, by loss of usual love for the chase, and of keenness of scent, and by a series of symptoms that constitute a gradual or sudden change in the animal's character (Pierquin).

As in man, the effects of injuries or accidents may long remain *latent*, and then appear suddenly and seriously.

Many animals—domestic and wild—are enraged by the *wounds*—mostly from firearms, but also from whips, sticks,

or spurs—inflicted by man. It is not at all probable that this furiosity arises simply from the pain they suffer. In many cases, at least, the animals have been previously persecuted, hunted and harassed by man: they are consequently jaded, and are in a condition of double irritation—mental and bodily.

Wounds produced in animals by each other lead to the same sort of results as those inflicted by man. Thus we are told of cases of collie dogs, wounded by a stag's horns, being *stupid* ever after, losing all their former courage, this mental condition being associated with epilepsy and with paralysis of the wounded limbs (Stewart).

The use by man of instruments or appliances that prevent freedom of action or vision, of respiration or the gratification of the natural desires, or propensities, that restrain exercise, or prevent food supply, is another direct provocative of mental annoyance or excitement, more or less intense. For instance, the *muzzling* of the dog in hot weather is apt to produce the very evils, or conditions, it is avowedly intended to prevent or guard against. Ferocity, mania, rabies itself are not uncommon or unnatural results (Pierquin). Its use is quite comparable with that of the strait-waistcoat or jacket in man, which, though preventive of danger to himself or others in the sufferer from mania, delirium tremens, or the delirium of fever, would by its limitation of freedom of action drive most sane men frantic. The *blinkers* of the horse furnish another illustration of an instrument which is not only useless, but dangerously mischievous.

Passion is easily produced, or provoked experimentally in monkeys, by man (Darwin), and it may be made to exhibit all its degrees, between mere 'temper' and mania. But man's usual object in the artificial excitation of anger is the capture of the enraged animal. Thus he catches the Tarantula spider, of Nicaragua, by lowering into its hole a string with a ball of soft wax at its end, 'jerking it up and down until the spider gets exasperated so far as to bury its formidable jaws in the wax, whereby it can be drawn to the surface' (Belt). The trap-door spiders of New Zealand

'are sometimes much fiercer and more pugnacious than at other times. But you can always, by teasing them with a straw, or otherwise, make them do battle' (Gillies).

There is, then, a large proportion of animal insanity that is directly or indirectly artificially produced by man. Whether it be the result of intention to create insanity, or of deliberate cruelty, provocation, or ill-usage, or the outcome simply of thoughtless ignorance, it is not the less *preventible.*

It is interesting to note that the same kind of mental effects that are producible in other animals, are producible also in *man*, when the same substances have been self-administered, a circumstance that has been known from very early times. Thus Theocritus points out that delirium or furiosity was equally produced in man and other animals by certain gaseous poisons. Goats were intoxicated by the fumes of the Delphic Grotto. Erotomania of an intermittent, periodic, or continuous kind, is producible equally in man and other animals by the same toxic agents (Pierquin).

Homicidal mania in the East is equally producible in man and other animals by the use of bhang, betel and opium (Cursiter). It used to be also produced in their war oxen by the Hottentots (Pierquin); but we are not informed as to the nature of the means employed, though it was probably some indigenous vegetable excitant.

In connection with the various forms of mental derangement, artificially produced in other animals by man, it is further of interest to consider the kinds of insanity that are artificially created in and by *man* himself. His object is usually, either in order to—

1. Impose, for his own purposes, on popular credulity; or—

2. For the production of warlike courage, to substitute an artificial and spurious bravery for natural, moral, or physical courage, both of which are wanting;

And frequently the physician, physiologist, or pathologist—

3. Experiments upon himself, in order to the perfecting

of his knowledge of the mode of action of this, or that, new drug.

In classical times and countries, priests, sybils, pythonesses, oracles, sorcerers and witches, voluntarily and artificially produced in themselves ecstasy, visions, dreams, furiosity, and other morbid mental phenomena, by—

1. Eating narcotic leaves.
2. Imbibing narcotic fumes.
3. Swallowing narcotic draughts (Pierquin).

It would appear that man can also produce in himself some, at least, of these minor forms of mental disturbance, by purely mental or moral means, or by means conjointly physical and mental. Thus the New Zealand Maoris are said, prior to the colonisation of that country by the Europeans, to have produced in themselves a battle-fury,[1] of the nature of *homicidal mania*, by dances, songs and recitations. That such influences are quite as capable of giving rise to insanity as those which act poisonously on the brain, or nervous system, there can be no doubt, whether as regards other animals, or man, as is fully pointed out in a special chapter on 'The Moral Causes of Mental Defect and Disorder.'

Self-stimulation by such substances as alcohol, opium, and haschisch, or bhang, by savages, semi-savages, or civilised people, may amount in its minor or milder degrees to, or may beget, the spurious and temporary courage of the kind required by the hired bravo, for his cowardly assassinations. Or it may become, for instance among the Malays, a homicidal frenzy, or *murderous mania*, which can therefore as readily be developed at will as the artificial courage of the bravo.

The use by man of various of the narcotic *solanaceæ*, *papaveraceæ*, *umbelliferæ*, *ranunculaceæ*, fungi, or their products, to produce in himself mere pleasant stimulation, ecstasy, semi-stupor, or anæsthesia, is too apt to lead to the unwelcome development of frequently uncontrollable, or

[1] A good illustrative plate of the Maori War Dance, and of the physiognomy of artificially induced mania, is given in the late Dr. Arthur Thomson's 'Story of New Zealand,' 1859, vol. i.

irremediable mania, imbecility, dementia, or idiocy. And similar results are apt to occur in the lower animals, under the use of similar substances. Both in other animals and man, what is, in its minor form or milder degree, *curable* and temporary, is only too liable to become permanent and *incurable*.

The usual characteristics of artificial insanity in the lower animals are, or include—

1. Its sudden incidence.
2. Its rapid progress.
3. Its well-defined symptoms.
4. Its limited duration; and—
5. Its curability, or the tendency to natural recovery.

Man, however, has it in his power, by the mode in which he applies the producing cause—perhaps in some instances by the very nature of that cause—to substitute for the usual characteristics the opposite ones of—

1. Gradual and insidious development.
2. Slowness of progress.
3. Anomalous symptoms.
4. Protracted existence; and—
5. Incurability, or hopelessness of recovery.

The artificial creation of *fear*, or fright, intentional intimidation, for a specific purpose, whether by man, or by other animals among themselves, fitly falls within the scope of the present chapter.

The specific purpose, either of man or of other animals, is usually to paralyse efforts at flight, escape, or resistance—to produce bewilderment, agitation, terror, immobility. And the means employed to this end include, in the case of man, as well as of other animals—

1. Loud discordant cries of all kinds—yells, howls, roaring.
2. Grimaces, or facial contortion.
3. Inflation of various bodily appendages.

The intentional inspiration of fear, or terror, is a common part of the policy of various animals in the pursuit of their prey. They make efforts at intimidation, which involve a knowledge of its value or uses.

The elephant deliberately frightens, or tries to frighten, man, or other animals, by make-believe fury and pretended charges or assaults (Pierquin). On the other hand, the Indian shikaris, by their tom-toms, endeavour to produce fear or fright in the tiger, or other wild forest animals. Sometimes the *motive* is a mere love of fun, as in the practical joking of the parrot, mocking bird, man, or monkey, on man or other animals.

CHAPTER VII.

INTOXICATION.

THE phenomena, and the circumstances, of alcoholic intemperance and intoxication in the lower animals illustrate—

1. The unfortunate fact that certain other animals are not free from sane man's worst vices—vices which, however, in most cases, they acquire directly from himself.

2. The suggestive fact that alcohol and other stimulants produce the same kind of effects on the brain and mind, nervous system and general bodily functions and conditions, in other animals, as in man.

3. The opposite, or different effects occasionally produced by the same drug, or poison, according to individuality and idiosyncrasy, to sex and age, to species or genus, to physical structure, and to habits of life, or to other modifying causes.

4. The singular perversions of appetite, the artificial tastes, to which they are subject, or which they acquire—by imitation, or otherwise—from association with man.

Alcoholic inebriation in all its degrees of tipsiness and drunkenness, a decided love or fondness for malt or spirituous liquors of almost every kind, occur in a considerable number and variety of animals, from among the lowest to the highest. Thus I have notes of its occurrence so low down in the zoological scale as among the *medusæ*, while higher animals include—

1. The orang and chimpanzee, the mandrill, pigmy, and other apes or baboons, coaita, sooty mangabey and other monkeys, the diadem, or other lemurs, and the lori—among the *quadrumana*.

2. The horse and pony, ass and mule, elephant, dog, rat,

racoon, cat, cow, goat, lion, hedgehog, Malayan, sun, and other bears, and the pig, among *quadrupeds*.

3. The common domestic fowl (cock and hen), turkey, parrot, kite, starling, and certain thrushes, among *birds*.

In other words, most domestic and pet animals—many menagerie ones, and many wild ones—representing the quadrumana, quadrupeds, and birds, in various ways acquire so strong a liking for spirits of various kinds, that they indulge their appetite whenever opportunity offers.

The special fluids selected for self-intoxication include all the commoner malt and spirituous liquors, such as ale, beer, porter and stout, whisky, brandy, rum, gin and arrack, with various wines, such as champagne. And, as in the case of man, while some animals appear to have a promiscuous or indiscriminate appetite for spirits of any kind, others have their favourite beverages, and sometimes will drink no other. Likes or dislikes for any particular kinds of spirits have been most frequently, perhaps, observed among the domesticated quadrumana, from their presence at man's table, no doubt, and the facility with which their habits at table may be noticed. But they are by no means confined to the anthropoid or other apes and monkeys.

A common preference would appear to be given to champagne. Thus, of a pet Malayan sun bear, that was frequently admitted to his table, Sir Stamford Raffles tells us: 'He gave a proof of his taste, by refusing . . . . to drink any wine but champagne. The only time I ever knew him to be out of humour, was on one occasion when no champagne was forthcoming.' A tame diadem lemur, too, 'was very fond of champagne, and after such a treat, his friskings and playful tricks were beyond description funny' (Broderip). Among the decided food preferences shown by domesticated bears is a partiality for champagne (Cassell).

The elephant frequently manifests its love of arrack, the spirit, no doubt, to which it has easiest access, and it is readily intoxicated therewith. The mandrill prefers porter and gin (Cassell). Certain monkeys and parrots are fond of rum (Buckland), and the coaita monkey and chimpanzee, and various apes, of wine (Cassell). Baboons are

partial to beer (Brehm). The orang shows a preference for different kinds of wine. Other monkeys have a special liking for beer. The donkey, too, has acquired a penchant for beer (Watson), as has the hedgehog. Wood mentions a Newfoundland dog that regularly, after his daily swim, called at a certain beershop for his pint of beer. Even a pet starling became 'very fond of wine and spirits.' From these statements it is not to be inferred that particular species or genera of animals have a partiality for special forms of spirits. The inference, rather, is simply that the individual animals mentioned display a fondness for those forms of alcohol which are of readiest access.

Illustrations of what appears to be, but may not necessarily be, a less discriminating appetite for all kinds of alcoholic fluids, are to be found in such facts as the following. A Borneo orang, mentioned by Buffon, would 'eagerly drink all sorts of wine, particularly Malaga.' An Exmoor pony was a 'horrid toper, and drank all kinds of liquor with great relish. It could drink a glass of whiskey without spilling a drop, and was passionately fond of oatmeal plentifully soaked in porter.' A sooty mangabey (monkey) 'had acquired a good number of bad habits. Among these was an ardent thirst for all manner of intoxicating drinks.' A racoon showed 'a great partiality for intoxicating liquors, especially those that are sweet;' while an orang also evinced 'a great partiality for all kinds of strong drink.'

Various eccentricities of an acquired or artificial, morbid or perverted, taste or appetite are exhibited in the form of as striking *dislikes* of certain beverages, as of likings to others. Thus a cat that was irresistibly attracted by porter refused her more natural and innocent aliment—milk. A chimpanzee had a liking for wine, and could judge its quality like a human connoisseur, but it had an equal dislike for spirits (Cassell). A dog that lived at a brewery 'was so passionately fond of drinks that he would turn away disdainfully from biscuits or sugar, but would swallow any stimulant greedily.'

Moreover, animals are frequently bribed by what they do relish in the way of drink to use what they do not. Thus

the mandrill gets gin in order to induce it to use tobacco (Cassell).

In all these cases the liking for *alcohols* of different kinds differs in its degree. There may be mere gusto or relish for intoxicants, obvious pleasure or enjoyment in tippling, grog or beer drinking, just as in man. But, though in exceptional cases animals have the force of will, or the good sense, to stop in time, while others may, fortunately for themselves, acquire at the very first a disgust at, instead of a relish for, all sorts of spirits, or for some particular form of alcohol, there is a danger in all cases of the liking becoming a craving, and the craving becoming insatiable, irresistible, *morbid*, amounting then exactly to what in man is called *dipsomania*; in short, the drink-craving is apt to become a veritable disease. The habit of tippling, habitual intemperance, is as apt to be engendered in other animals as in man, and it is in them equally dangerous, equally liable to pass beyond all limits of control.

The horse is represented as enjoying its ale. Fowls show obvious satisfaction when their corn is steeped in spirits. The tipsy ape is said to enjoy its tipsiness (Houzeau); and there are many other animals that take a visible delight in other forms of dram-drinking.

A certain Parisian dog, we are told, 'drew his half-pint of kirsch every day, and not content with that, would go from table to table (of a restaurant) to try for more.' A Borneo orang drank a bottle of Malaga wine 'to the last drop,' having himself uncorked the bottle (Buffon). Not a few animals, then, readily become, when the temptation is thrown in their way, habitual topers, tipplers, or drunkards.

Frequently the love of alcoholic fluids becomes inordinate and uncontrollable. Thus we are told of a cat for which 'porter had a fascination that she could not withstand.' Wary rats 'drink themselves dead drunk from spirit casks whenever they get an opportunity' (Wynter). The ape is undeterred from a carouse by punishment or prohibition. Of very few animals that once betake themselves to the use of alcoholic stimulants can it be said, as was said of a certain pet starling, that 'he knew when he had had enough'

of the wine and spirits, of which he was, nevertheless, very fond. In the majority of cases the animal indulges its liking till insensibility, unconsciousness, helplessness supervene. Just as in human *dipsomania*, no sort of personal consideration prevents the gratification of the morbid appetite. All the usual caution, love of life, fear of danger, affection for young, dread of punishment, are forgotten; all experience of capture or of suffering goes for nothing. The propensity becomes inveterate, incurable: it is a veritable form of *moral insanity*.

One debauch usually leads to another. But there are cases in which a single experience of the effects of alcohol is sufficient to make an animal a teetotaller for life, by inspiring it with a disgust at, which leads to refusal of, everything alcoholic, including ordinary articles of food steeped in, or saturated with alcohol, experimentally by man. Such animals have had the exceptional sense, courage, force of will, to profit by their disagreeable experience. Thus a fox-terrier of Mrs. Mackellar's, having had a glassful of whiskey forced down its throat one New Year's Eve by a number of waggish sailors, naturally became furious and dangerous for the moment. But he never could bear even the 'smell of drink' again, even in men, his usual companions and playfellows.

In many dogs and other animals the mere sight or smell of a spirit bottle or of alcoholic spirits inspires repugnance or disgust—in most cases from the association of ideas of former suffering, the result of some of man's barbarous practical jokes. Thus in a baboon intemperance was effectually cured by firing some brandy, of which it had become fond (Cassell). In this case terror inspired by the flame, connected ever afterwards with the sight and smell of brandy, was probably the most efficient element in the cure.

Dr. Murray Lindsay, of Derby, to whom I am indebted for various interesting dog-stories, tells me that a dog of his would not touch spirits of any kind, but was exceedingly fond of sugar; and that when sugar was, for experimental purposes, steeped in whiskey, brandy, or other forms of

alcohol, and offered to it, the poor animal was distracted between its appetite for the sugar and its dislike of the spirit; it was hesitant and annoyed, reluctant to swallow the nauseous sweet, equally unwilling to let it go, but finally it preferred to lose the sugar rather than partake of the abhorrent liquor with which it was saturated. In such a case the probability is that the animal had on some previous occasion experienced the disagreeable effects of alcohol, administered alone, or disguised by saccharine or other bribes.

Temperance, then, so far as concerns alcoholic stimulants, is sometimes, in other animals as in man, taught by experience: a fit of tipsiness, the fruit of incautious or theftuous self-indulgence, may prove a salutary lesson. Jackson mentions the case of a dog that, once drunk, ever afterwards refused the same kind of intoxicating liquor that had produced what must have been felt by itself to be disagreeable effects—to wit, beer—growling even at the sight of a beer pot. In all such cases there is obviously not only a vivid memory or remembrance of the effects of a former indiscretion or of a master's practical joke, a profiting by disagreeable experience, a proper association of ideas, but an accurate idea of causation, of the relation of cause and effect, and sufficient resolution, in the event of further temptation, or experiments of a similar kind, to choose the proper course by avoiding or resisting them.

Animals acquire a morbid taste for alcoholic liquors in one of several ways—

1. They may acquire it for themselves directly, *without man's intervention*, as in the case of rats broaching wine, spirit, or beer casks.

2. Alcoholic stimulants may be, in the first place, administered by man as a *medicine*, or for the purposes of physiological or other *experiment*—as in the horse.

3. Much more commonly alcoholic intoxicants are offered to, or forced upon, various animals by man, either—

a. 'For fun,' as a practical joke, in order that he may amuse himself with the drunken antics, orgies, or mistakes of the poor animals; or—

b. As a bribe or reward to get them to do extra work; or—

c. For the purposes of capture; or—

d. For various nefarious purposes, including especially theft and burglary—perhaps even murder.

In whatever way or form, or for whatever purpose, the alcoholic liquor is originally administered—by the animal to itself or by man—a fondness for alcoholic stimulants or intoxicants is either gradually or at once developed.

In the case of rats broaching casks of wine, spirits, or beer, there is probably, at first at least, no special search or craving for alcoholic fluids. What is urgently wanted is fluid of any kind, to quench consuming thirst, and any accessible fluid, whatever its nature, is at once attacked. They find out for themselves, however, that certain fluids are unpleasant and deadly, while others are pleasant and not necessarily fatal in their effects. And there is every reason to suppose that rats, like so many other animals, having once tasted alcoholic fluids, at once approve of them, and acquire a decided taste for them, which taste developes into a craving in proportion to the frequency with which it is gratified. Monkeys and apes also find out for themselves, in their propensity to taste everything that man drinks, what they too consider the agreeable qualities of alcohol.

It is apparently becoming more and more a practice for veterinarians to administer alcohol to the lower animals in various conditions of disease, just as it is for physicians to give it to children and women—in both cases, it is to be feared, without due appreciation of, or reflection upon, the possible results. Thus a Natal lion, that ultimately died of fever in the Zoological Gardens of Dublin in 1864, was treated with 'large draughts' of whiskey-punch. 'On the Sunday before he died, the people from Dublin came out in large crowds to see him take his punch, which they said he did just like a Christian.'

Among the medicinal or therapeutic applications of alcohol among the lower animals may be included its use by man as a stimulant of energy or activity, as a means of developing mettle or spirit, courage or combativeness, in

animals intended to fight for man's sport. It has the useful property of contributing courage where it did not previously exist or would not have been exhibited, of adding to or intensifying it when it already exists. It would appear to generate, in other animals as in man, a spurious or Dutch courage where real courage, moral or physical, does not exist; but it is always apt to do more than this—to generate fury or ferocity of a kind that may prove as dangerous to man as to the combatant animals that are made the unwitting subjects of his sport.

Alcoholic stimulants are frequently given as *bribes or rewards* for good service to man—as in the case of the elephant with arrack. But the use of the bribe in such a case evidently presupposes a previously acquired taste on the part of the animal for the spirit.

Intoxication by means of alcoholic drinks is frequently produced artificially and intentionally by man for the purpose of *capture*—for instance, of certain monkeys. And occasionally the beer or other attractive liquor used is drugged with some *narcotic*, so that the stupifying effect is not wholly alcoholic. Thus drugged beer is employed in the capture of certain monkeys in Abyssinia (Manley and Parkyns). The monkeys of Darfur (Africa) are inordinately fond of beer, and avail themselves of every opportunity of making it the means of a debauch. Under its use they readily become victims of inebriation, and display certain follies of inebriety that are favourable to man's schemes for their capture. Their memory, senses, ideas, become confused; they fail to distinguish the negroes from themselves; they cling stupidly to each other, using their paws as hands, 'following the lead' like so many sheep; they allow themselves, in short, to be taken wherever their captors may desire.

Dogs, monkeys, horses, elephants, and other animals, are not unfrequently deliberately *taught to tipple* by man, the unfortunate brutes taking to the practice with a relish or gusto that delights their senseless tutor. Thus Le Vaillant tells us how certain baboons in this way became regular topers; and Watson how a certain elephant was treated to an evening glass of spirits along with its master.

The *effects* of alcohol on mind and body in the lower animals are of the same kind as those in man, varying in degree from simple transient, probably pleasurable, excitement from small doses up to sudden or speedy death from inordinate quantities. As in man, the effects vary according not only to the dose or quantity, but according to the individual, the species and genus, to whom or to which it is administered. Thus from the same amount of the same form of alcohol, given under apparently the same circumstances, one animal may remain quiet and passive, while another becomes mettlesome and dangerous; one may commit only a series of ludicrous absurdities of conduct, while another developes a fury, ferocity, or destructiveness that are highly dangerous to themselves, to other animals, or to man.

The more marked effects of alcohol on the economy of the lower animals include the following:—

1. Simple passing *excitement*, which may, however, be variously exhibited in the form either of good or bad humour; the animal may become morbidly facile, so that capture becomes easy, or irascibility is developed, rendering it an unpleasant or unsafe associate. In the parrot wine developes unusual loquacity or garrulity; in the horse, viciousness—it becomes unmanageable by reason of its kicking and biting (Pierquin).

2. The excitement may be more permanent and more intense—for instance, in the case of elephants or other animals purposely rendered furious by wine or other stimulants in order that they may minister to man's sports or other requirements. Thus we are told that Ptolemy Philopater, ages ago, massacred Jews in the hippodrome of Alexandria by causing them to be trampled to death by elephants rendered furious by wine and frankincense. And we have already seen that animals intended to fight with each other for man's amusement are endowed with the necessary amount of courage and combativeness by the use of various forms of alcohol.

3. Reactionary *depression*, mental and physical, following excitement, constituting what is quite as really a dismal mood or humour as in man, associated probably with such

bodily feelings as headache. After drunkenness come the dismals in the baboon as in man (Brehm), and it is possible, nay probable, that in this condition there is frequently a feeling of self-loathing on the part of an animal—e.g., especially in dogs that have after a single experience of alcohol resolutely renounced its use even when offered in the most tempting forms.

4. *Stupidity* in various degrees and forms, including incapacity to provide for safety or appreciate danger. This stupidity involves many serious, even fatal, *errors* of prudence or policy, as in the case of a drunken monkey rashly attacking a shark (Cassell).

5. Eccentricities of *motion*—in the form so common in inebriate man—of reeling or staggering.

6. *Stupor* or stupefaction—of all degrees up to the condition known in man as 'dead drunk'—insensibility, unconsciousness, equal loss of thought, feeling, will, memory, and motion; a state of abject, prostrate helplessness, in which the unfortunate animal becomes the prey of man, its other enemies, or its own fellows.

7. The series of phenomena, bodily and mental, known in man as *alcoholism*—as produced experimentally, for instance, by Magnan, and including probably a condition analogous to or approaching *delirium tremens*.

8. *Arrestment* of physical *growth*. Thus gin is administered to dogs to check and dwarf bodily growth (Ross).

9. Various forms of *insanity*, including especially, as already stated, *dipsomania*.

10. *Death*, more or less speedy. Thus Du Chaillu mentions drunkenness followed by death in a young chimpanzee from inordinate brandy drinking; and Büchner describes an orang that 'died through drinking up a bottle of rum which he had stolen, uncorked and emptied.'

Moreover, the effects of the use or abuse of alcohol in the lower animals include the same kind of general, functional, and organic changes as in man, the same morbid appearances after death. Thus Dr. Richardson, who has so ably and so long studied all the phenomena of alcoholism in man and other animals, including those which are revealed *post*

mortem, says, 'In the lower animals I have been able to witness this extreme vascular condition of the lungs,' the result or concomitant of the first stage of alcoholic excitement—that of exhilaration—a condition of congestion that is universal throughout the body. In this first or exhilarative stage in birds and mammals there is during life the same rise of temperature of body that occurs in man; while in the third stage of insensibility there is, as in him, an unnatural fall of temperature.

Alcoholism is virtually the same in its character—using the term in its most comprehensive signification, as including all the phenomena, mental and bodily, produced by alcohol—throughout the animal series. Thus the recent experiments of Romanes show that even the *Medusæ* suffer in the same way that man does under the influence of alcohol. 'A tipsy jelly-fish rolled about in the water just like the staggering of a drunken man, and this was followed by torpidity, or a state of complete drunkenness, from which nothing could arouse it. In the course of a few hours it began to recover, and eventually the recovery was complete.'

Nor must we ever forget the suggestive fact that the effects, mental or bodily, in the individual, of the use or abuse of alcohol in any of its many forms become organised and *hereditary* as certainly in other animals as in man.

The dog recognises the condition of drunkenness *in man*, and appreciates its practical effects so far, at least, as itself is concerned. Experience, no doubt, has taught it that a tipsy man is apt to become irritable, and that his irritability is likely to find vent on its own ribs if it does not keep out of his way. The sensible animal avoids the only too probable ill-usage of a tipsy master by absenting itself from his presence so long as he is visibly under the minor influence of drink. Thus Wood gives two anecdotes illustrative of the shrewdness of dogs in avoiding their masters when tipsiness was threatened, and so long as the chance of it continued. One of them hid itself whenever its master, in his drinking bouts, got the length of his fourth tumbler of toddy, 'never showing itself until the effects had passed off, and its master was restored to sobriety.'

A certain fox-terrier that had been itself rendered teetotal by an experimental glassful of whiskey forced upon him by sailors, if he saw these same 'seamen, to whom he was most attached . . . . the worse of drink, they would not dare to come near him' while they were tipsy or drunk; for in that case, instead of avoiding them, he inflicted salutary punishment, perhaps a justifiable, as it was a natural, revenge (Mrs. Mackellar).

On the other hand, the dog recognises the helplessness and harmlessness of utter drunkenness, in which case it not only does not avoid its master, but either couches itself beside him, or seeks efficient aid for his removal or protection.

Certain animals recognise tipsiness or drunkenness also in each other, or at least the eccentricities or the helplessness to which these conditions give rise—for instance, in and by the Indian kite. And they either punish tipsy or drunk fellows by causing them to lose caste or by more summary measures, or they take advantage of their disability, bodily and mental, to make prey of them.

The phenomena of alcoholic intoxication or poisoning in the lower animals are produced also—

1. By the fruits or other substances from which alcohol itself is prepared, such as grapes, grape refuse or grape must; and

2. By liqueurs in which, while alcohol is the basis, there are superadded drugs of a *narcotic* character, such as absinthe.

3. By other fruits from which other forms of alcohol than wine or brandy may be produced.

4. By the nectar of various flowers, which have an intoxicant effect—for instance, on bees.

Bears and asses have become tipsy from eating grapes (Chateaubriand); the horse, mule, ass, turkeys, and other animals from overeating grape refuse; and swine from feeding on must or wort, according to Pierquin. Self-intoxication is produced in the South African elephant by eating the ripe fruit of the umganu tree, 'of which they are passionately fond. . . . They become quite tipsy, staggering about, playing huge antics, screaming so as to be heard miles

off, and not seldom having tremendous fights. Native hunters fear to approach them when in this state,' because, no doubt, of their irritability and pugnacity. The fruit in question is capable of yielding 'a strong intoxicating drink' to the natives (Drummond).

Humble bees become intoxicated by the nectar of the passion-flower, for which they have a fondness 'to excess.' It produces on them the same sort of effects that alcohol does on other animals, including joviality, recklessness, reeling, tumbling, sprawling, and stupidity (Kirby and Spence). That their inebriety is attended with gratification, and that it is, frequently at least, intentional, is apparently shown by the repetition of the act of self-intoxication.

On the other hand, drunkenness has been artificially produced by man by the use of *absinthe*. For instance, when Dr. Magnan of Paris, before the British Medical Association at Norwich in 1874, injected it into the femoral vein of a dog, the animal became 'dead drunk.' Fowls have also been made the subject of man's experiments with absinthe, by giving it by mouth, and in this, as in many other ways, the animals have acquired man's pernicious habit of dram-drinking. Of a cock that had a liking for this liqueur we are told that after a dose he 'falls as if lifeless, and lies motionless on the ground. After some moments . . . . he tries to get up, but fails, and falls back, beating the air with his wings and scraping the soil . . . . Yet he goes on repeating the dose, just as though he were as stupid as a man.'

CHAPTER VIII.

DREAMS AND DELUSIONS.

It is generally known that certain of the lower animals, such as the dog, *sleep* in the same way, at the same times, and under the same circumstances as man himself does; that is to say, they usually sleep by night, or in darkness, and are awake by day, or in the presence of light, natural or artificial.

And, to a certain extent, some of the *disturbances* of sleep in other animals that are comparable with those of man have also been long recognised. By observers of animals' habits in all ages it has been noticed, for instance, that the dog, cat, horse, parrot, canary, bullfinch, and some other animals, *dream*, and the phenomena of dreaming in other animals than man have been described.

As regards the *dog*, and especially sporting dogs, such as the harrier, the following facts have been noted, or the following inferences drawn. It appears to hunt in its dreams, as was long ago remarked by Seneca and Lucretius. During sleep movements of the tail and paws, sniffing, growling, barking, occur. There is every reason to believe that there is frequently during sleep in the sporting dog an *imaginary* pursuit of imaginary game; that this supposed pursuit gives rise to actual physical and mental excitement, including, for instance, eagerness, and panting for breath caused immediately thereby; and that this excitement sometimes causes the animal to awake. At first it is bewildered to find its actual position so different from that painted by a morbid fancy—no game where it expected to be 'in at the death,'

itself probably on a hearth rug before the dying embers of a library fire, or within the walls of its kennel. But it speedily realises its error, distinguishes between fact and fancy, the imaginary and the real, becomes aware, in short, that it was dreaming, and again betakes itself to repose.

Here there is indubitably for a time, and in a sense, *delusion*, belief in an unreality, and action determined by that belief. But the delusion is quite compatible with, and common in, what is assumed to be practically *sanity* both of mind and body, though there cannot be dreaming without a certain amount of disturbance, both psychical and physical. It is, in short, a sane delusion, temporary, corrigible, and corrected by the use of the senses and judgment, and it is a sane delusion equally in man and other animals. Were the delusion an *insane* one—did it exist, that is to say, in an insane animal—the dog would actually pursue an imaginary stag or hare. But it does so in the case of a sane delusion of a similar kind—a mere delusion of sleep or dreaming—only in imagination, while in a state of comparative physical quiescence, and ostensibly asleep in its kennel.

This distinction between *sane* and *insane* delusions is of the highest importance in regard to man as to other animals, and the subject will be taken up again and more fully illustrated in subsequent parts of the present chapter.

Just as hounds or harriers chase in their dreams imaginary game, collies or other dogs worry in their sleep imaginary enemies, or snap presumably at imaginary flies or other insect tormentors. In other words, in their sleep or dreams they appear to engage in imaginary quarrels, games, pursuits, attacks.

It has to be noted that dreaming in the *horse* is characterised sometimes by shuddering, shivering, quivering, quaking, or trembling. These phenomena are concomitants or results in the waking state of excitement, fear, ardour, impetuosity, or impatience. Hence it has been quite legitimately inferred by Montaigne and others that the same feelings or mental conditions are developed during sleep and dreaming, and are likely to be associated in the race-

horse with imaginary races, as in the sporting dog with imaginary coursing.

The phenomena of dreaming in the *parrot* are much more interesting than either in dog or horse, or indeed in any other animal not gifted with articulate speech; for it prattles or talks or repeats its lessons in its sleep or dreams (Houzeau). The same will probably be found to be the case in starlings or other birds that can speak intelligently; and the subject of *speech*, coherent and incoherent, during sleep and in the waking state is one of such interest—as it is illustrated by or among the lower animals—that it is greatly to be desired that owners of speaking parrots, starlings, or other birds would carefully note and record all the modifications of their speech that occur in sleep and dreaming, or in old age and disease.

Bechstein has described dreaming in the bullfinch, and it is noteworthy in his description that he points out that the *terror* begotten during sleep, the result of its dreams, which probably involved visual delusions of a horrifying kind, was such that it required its mistress's interference to prevent bad effects. It frequently fell from its perch in its terror, we are told, but became 'immediately tranquillised and reassured by the voice of its mistress."

It may, perhaps, be supposed that it is impossible to determine the presence of dreaming among the lower animals in the absence of the power of speech and writing, of orally or otherwise describing past ideas or sensations. But, in the first place, we must remember that, as regards man, infants and deaf mutes cannot describe their thoughts or feelings, and there are many idiots, imbeciles, and insane persons in the same helpless condition, who, nevertheless, we have every reason to believe, are quite as capable of dreaming as more favoured individuals. In some of these cases, indeed, imagination is probably at once more morbid and more fecund than in healthier individuals, and dreaming correspondingly more common. Life in some cases among the insane may be described as a chronic dream, of lurid or sunny character, as the case may be.

In man the presence of dreaming and the nature of his

dreams are frequently *inferred* simply from his facial expression, his voice-sounds, his actions or movements. As regards other animals, there are not a few birds that talk more intelligently than whole races of man, and whose talk gives us a certain amount of assistance in determining the presence of dreams, while in other animals we have the same sort of bodily movements, of facial expressions, of gestures or attitudes, or of voice-sounds, from which we infer in man the existence of dreaming. Thus in both cases we have vocal cries and muscular startings, as well as other sounds and movements.

All the evidence we possess entitles us to infer, I think, that the dreams of other animals resemble in their character those of man; that in these dreams fancy is more or less vivid or morbid; that eccentricities, incongruities, aberrations of the imagination necessarily occur; that the nature of the imaginary incidents may be either pleasurable or the reverse. We are warranted in going further and in supposing that, inasmuch as dreams occur among domesticated or captive animals, they are likely to occur equally in wild ones, whose sleep is peculiarly liable to disturbance—for instance, in those much persecuted by man or hunted by each other; and that, considering the precarious nature of their lives, the character of their dreams is probably more or less fearful, frightful, or terrifying. Moreover, it is quite proper to add, that habitual dreaming, in which morbid imagination habitually gives rise to morbid fear, is likely to pave the way to genuine or insane delusion, and to various forms or degrees of *delusional insanity*.

Pierquin and Guer, Elam and other authors, describe *somnambulism* as occurring in certain animals. It is even said to be common, and to be most so in sickly, nervous, timid, ill-used animals, in whom sleep is most apt to be disturbed. There is here a further development of unconscious and involuntary bodily movement, a series of actions resembling those of the waking state, in a condition closely resembling it. There is, moreover, apparent vision; the eyes are open, though the animal does not appear to see material objects. The phenomena include purposive action: fearless-

ness, perhaps of objects that in the normal state of waking would inspire dread; firmness; and composure or coolness in emergency—perhaps from non-realisation of the presence or nature of danger. The somnambulistic watch-dog prowls in search of imaginary strangers or foes, and exhibits towards them a whole series of pantomimic actions, including some of those which it displays in its dreams—such as barking (Guer).

Pierquin regards, and with perfect propriety, the distinction between dreaming and somnambulism as artificial. They are to be distinguished, perhaps, simply by the different forms or degrees of the accompanying *bodily* activity; for we have already seen that in ordinary dreaming, certain forms or degrees of bodily movement occur. Both are conditions, or results, of disordered sleep.

According to Pierquin, *nightmare*, too, occurs among the lower animals. As in other disorders of sleep, there may here be murmurs, cries, gestures or actions, tremor or other forms of motor or muscular disturbance.

Nor are the psychical phenomena of the half-waking, half-sleeping state—of the condition in which such an animal as the dog is placed when suddenly aroused or awakened from thorough, or disturbed sleep, unworthy of consideration here. The phenomena in question are in all respects peculiar, though they vary in character with the character of the animal, the degree of soundness of its repose, the nature of its dreams, the suddenness of its awakening, the nature of its surroundings on being aroused, or other circumstances. Usually there is more or less mental bewilderment, with a tendency to morbid fear and irascibility. The animal is apt to be 'roused' in more senses than one: it is liable, or likely, to confound friend and foe, and to attack, or flee from both, according to its natural disposition.

In exceptional cases, there is developed on the moment a kind or degree of excitement, of the nature of delirium or mania, or amounting to ferocity or furiosity, all more or less dangerous to man as well as to other animals. And it is probable that some sort of conviction that such dangers are always liable to arise from the violent, sudden awakening

of a sleeping animal, has given rise to the proverb which urges us to 'Let sleeping dogs lie.' We should never forget that such a dog may be dreaming at the moment of his sudden arousing, and that while he may be revelling in imaginary joys, the arbitrary cessation of which will give rise to keen surprise and disappointment, he may equally be an actor in some tragic drama, involving danger to his own life, in which case the sudden shock of his awakening may naturally appear as but part of the fancied reality, and he may show his belief in the unreality by identifying those who actually arouse him, with the imaginary enemies to whom he attributes all his pains or pangs.

In short, though roused from sleep, in one sense, the animal has not yet had time to emerge from its dreaming state; it still confounds unreality with reality, imaginary with actual enemies or disturbers—it has not been allowed to use its senses and its judgment in the correction of its dream-beliefs; and man must be responsible for the conseqences, in action, resulting from the abnormal mental condition of the disturbed animal.

If sudden awakening from sleep is dangerous at all times, and under ordinary circumstances, it is specially so when the animal is the subject of disease—mental or bodily—considering the frequency with which ferocity is one of the psychical results of disease, one of the most common forms of changed character, or disposition, it produces. Hence the obvious impropriety of interfering with the sleep of animals affected with such disorders as mania or rabies. Interference may, among other commoner results, develop on the moment dangerous delusions, attaching themselves to the human awakener, or to the nearest person, animal, or thing.

Hitherto we have been speaking of the dreams of the sleeping state. But dreams also occur in the waking condition in the dog (Pierquin). What, however, is sometimes spoken of as day-dreaming or reverie in the dog, or other animals, is more probably or usually wrapt attention, self-absorption, absence of mind, or allied mental conditions.

But the same kind of delusions occur by day as by night,

in the waking as in the sleeping state, with, and by the use of, the senses and consciousness, as in their absence. This subject reopens in the first place the difference between sane and insane, sensorial and other delusions.

Just as in man, then, all delusions in the lower ānimals are not to be regarded as necessarily insane, the result of, or connected with, *disease*, mental or cerebral. On the contrary, there are in both cases *sane*, as well as insane ones, the former distinguished as a rule by—

1. Their temporary, or transient character.

2. Their corrigibility, or dissipation, by the use of the senses and judgment; and

3. Their not leading to insanity of action or behaviour.

4. The absence of other indications of mental disturbance.

5. Their coexistence with, practically, perfect bodily health.

The difference between the two kinds of delusion—sane and insane, temporary and permanent, corrigible and incorrigible—may be illustrated by the following very common incident, familiar to all riders on horseback. A nervous, high-bred and high-spirited horse, while trotting quietly along some familiar enough turnpike in the twilight, or about dusk, all at once becomes restive, pricks his ears, stops and looks forward with a gaze and manner that indicate to his rider, if intelligent and experienced, the near presence of something, or some person or animal, that inspires in his horse suspicion, or dread, causing it to become startled. The dreaded object proves, perhaps, to be simply a bit of white paper, moving fitfully, and with a slight rustling sound, before a gentle breeze.

If the rider is sympathetic, humane and judicious, as well as intelligent and experienced, he will soothe the frightened timid animal, encourage it, give it due time to realise its true position, and to distinguish between real and apparent danger. He will probably—as I myself have done under such circumstances—at once dismount, pat the horse, talk to it, and lead it gently and slowly up to the fluttering piece of paper, on which he will place his foot and rub it there-

with, to show how harmless and inanimate it is, then allow the animal deliberately to look at the object, sniff at it, perhaps also kick it or trample on it, until familiarity begets a contempt for it as a terrifying object—and the animal thereby realises the fact that it has committed an *error of timidity*. The result in such a case is, probably, that the horse, convinced of its blunder, satisfied of the utter innocuousness of the supposed dreadful, or of the mysterious, object, trots briskly forward and shows no fear of the next fluttering piece of paper, whose real qualities, or nature, it has learned by experience to recognise or appreciate.

But now suppose the rider of the same horse, under the same circumstances, not to be intelligent, or experienced, sympathetic, humane, or judicious. Let us regard him, as what he too frequently is, alas! inexperienced and unintelligent, some tipsy, impatient, irritable, ignorant, indifferent boor. Annoyed at the animal's hesitancy, looking upon its shyness and shying as a mere vice of temper, to be corrected by firmness or punishment, determined to assert his own supremacy, he lashes and spurs the frightened brute up to, and past the object of its terror. The animal protests by every means in its power, rears, plunges, backs, tries to throw its rider; but finding all these efforts fruitless, goaded into fury by ill-usage, all but 'frightened out of its wits' by abject terror, or horror, the animal rushes off at full gallop, in desperation, possibly in unconcern, almost in unconsciousness, far past the cause of all its groundless alarm. The next bit of paper, in this case, produces a repetition of the scene, and the incident happens so frequently, that the animal acquires a 'character' for dangerous skittishness, the result wholly of man's evil usage, until its owner is glad, at any sacrifice, to part with his, perhaps once favourite horse, on account of a supposed incorrigible vice.

If even yet, under a new proprietor, the animal is but treated kindly and judiciously, all will, or at least may, probably go on well: the morbid dread may be, sooner or later, eradicated, or corrected. But under other circumstances, a morbid fear of moving bits of paper, or of other white objects in motion, may possess the animal for life, and

such a dread may be the cause of the most serious accidents to human life. Not only so, but morbid fear may not be confined to white paper, or other white objects, whether in motion or at rest. It may gradually extend until it becomes general, assuming that most dangerous perhaps of all forms of insanity—*panphobia*.

So simple and common a series of incidents affords matter for grave consideration, illustrating as it does—

1. The groundless, and therefore morbid, terror produced in many animals by the most harmless inanimate objects, if in motion, or seen under special circumstances.

2. The danger to human life arising from temporary and trivial disabilities—mental or bodily—in domestic animals.

3. The simplicity and efficacy of judicious treatment; and—

4. The great influence for good which man possesses, but so seldom exercises, over subject animals, his beasts of burden or carriage.

The deceptions produced by the mirror, by paintings, by stuffed animals, by representations of man or other animals, for instance in scare-crows, furnish instances of *sane* delusions, compatible with, and accompanying sanity of mind and body in all other respects, and there are obviously hosts of other *errors* of animals that are based on *delusions*, sensorial or other. In truth, all the common *errors of the imagination* in sane ordinary animals may be considered *sane delusions*.

Of special interest are *sensory delusions*, those connected with the senses of vision and hearing in particular, because among other reasons they illustrate the transition of sane into insane delusions, with the difficulty, or impossibility sometimes of drawing the line between them, of distinguishing the one from the other. Moreover, the same kind of delusions of sight and sound occur equally in canine rabies and human hydrophobia. They occur, further, in the same animal, and possibly at the same time: in which case it may be difficult to determine whether vision or hearing, singly, or both, are affected, and in the latter case which was the primary, and which the secondary, affection. Thus

we frequently hear of dogs barking at imaginary sights or sounds. Wood tells us of a terrier that would bark by the hour together at some imaginary sound.

Delusions of vision may be specially studied in the horse, in whom they are frequent and natural results of defects or disorders of the organ of vision—the eye— or of the absurd or vicious ways in which man prevents due vision by the animal. We have already seen that, even with perfect sight, in certain lights, certain horses *misinterpret* the character of harmless objects, they are easily frightened or startled, subject to groundless alarm. Their inordinately vivid or morbid imagination creates ideas of danger where no real peril exists, and a morbid sensitiveness and restiveness are the result. It can readily be understood that this extreme timidity, this proneness to take unnecessary alarm, to conjure up imaginary evils, becomes much greater when defective vision of any kind, and from any cause, exists. According to Pierquin, sight and the eye—as well as a disordered imagination—are more commonly involved than is supposed in the skittishness, or restiveness, of the horse—an opinion that cannot be too carefully kept in view by all who are called upon to deal with horses of the higher breeds, —especially riding and carriage horses—considering the nature and number of the serious accidents to man which spring from such skittishness or restiveness.

Delusions of sight in animals occasionally take the form, as in man, of phantoms or phantasms, of spectral images, of *visions*, of ghosts or apparitions, of imaginary persons, animals, or things. And, moreover, it would appear to be the same kind of spectral images that occur in other animals as in man, in canine rabies, for instance, as in human hydrophobia. Further, the same kind of visual delusions occur to man, and other animals at the same time, and under the same circumstances. Thus impressionable women and their domestic pets have been represented as seeing ghosts at the same, or about the same, moment in the same room or house.

Wood gives the case of a lady and her cat simultaneously seeing, and being variously affected—mentally and physically

—by seeing, a vision of an old wrinkled hag. In both, terror was developed, though the mode in which expression was given to it differed. The lady became the victim of a helpless fascination, of paralysis of mobility and speech, while the cat, on the contrary, made frantic efforts at escape. Probably in both cases—if there be any truth in the incident at all, and Wood apparently believes in its authenticity, in the perfect credibility of his informant, the lady herself to whom the incident occurred—we have to do with a *dream* of the sleeping, or half-sleeping state; for we are told that the event happened about bed-time, while both mistress and pet were half-asleep before a comfortable fire.

If such a case of 'spiritualism' is to be explained in so simple a way, it is obvious, however, that we cannot accept the lady's *inference* that her cat saw the same hag that terrified herself. The lady and the cat were coincidently half-sleeping, half-awake: that is described as a fact. And the lady describes her vision as another fact. But when she asserts that the cat saw, or must have seen, the same vision, we have only to deal with her inference and her own interpretation of the cat's behaviour, which admits of explanation in other ways. For instance, it is quite as likely that the cat was dreaming as the mistress, that its dreams were of a horrific kind, and that the mental impression was sufficiently intense and prolonged to lead to violent efforts at escape from some fancied horrific object.

Unfortunately, in other animals, as in man, visual delusions, like dreams in general, appear more generally to be of a terrifying, or pain-giving, than of a pleasurable kind.

Spectral delusions occur in several forms of insanity, sympathetic or other, among the lower animals; for instance, in that of rabies in the dog, of sturdy in the sheep, and of sunstroke in the ape. Of a rabietic dog Fleming writes:—'It appeared as if it was haunted by some horrid phantoms. . . . At times it would seem to be watching the movements of something on the floor, and would dart suddenly forward and bite at the vacant air as if pursuing something against which it had an enmity.'

This snapping at imaginary foes is supposed by certain

authors to usher in the more dangerous symptoms of rabies —to constitute one of its marked features and stages.

A she-ape suffering from sunstroke is similarly described by Pierquin as terror-struck by imaginary foes or sights—and as snapping at imaginary objects. She acted as if she had been watching and catching insects on the wing.

Auditory delusions occur under similar circumstances to, and, indeed, they usually accompany, visual ones. Thus in rabies a dog 'would throw itself against the wall, yelling furiously as if there were a noise on the other side' (Fleming); while the ape above mentioned behaved as if she heard familiar or strange, attractive or repulsive, sounds (Pierquin).

In man very great difficulty is experienced in distinguishing *sensorial delusions*, which are supposed to originate *ab extra*—in some impression from without, from those which are not connected with the senses, that originate, or are believed to do so, *ab intra*, and that are distinctively called *intellectual*. The distinction between false notions, ideas, or conceptions, not involving the special senses, and those others that do implicate more or less these senses, is not always either proper or practicable. It is arbitrary and insufficient, because all sensorial delusion must involve false ideas—morbid ideation; while the most purely intellectual delusion seldom leaves sensation uninvolved. In other words, both in man and other animals, disordered sensation must lead to disordered ideation, so that whether or not there be such a thing as intellectual or ideational disturbance independent of sensational, sensorial necessarily leads to ideational, disorder.

Naturally, however, we have less clue to the ideas, normal or abnormal, of other animals than to those of man; and, therefore, we have not the same means, or at least the same variety of means, of judging of the presence in the former of delusion, even of the sensorial kind. We are destitute of the proofs, or at least of the aid, furnished by man's speech, writing and printing—by his power of describing, in one or another, his ideas or sensations.

We have, however, the same kind of phenomena of *action*, look, voice, of attitude or gesture, from which we infer the

presence of delusion, sensorial or other, in certain forms of human insanity; and it is clear that if such phenomena are to be accepted as conclusive in the case of man—and they are so—they cannot be less so in the case of other animals. In man, indeed, these phenomena of action afford a guide which speech and writing fail to give us; and there is nothing remarkable in this if we bear in mind that the phenomena in question constitute the *natural language* of man and other animals, and that the expression of ideas and feelings by such means may be involuntary and spontaneous; while speech and writing are eminently artificial, and may be used with effect to conceal, instead of making evident, real thought or emotion.

Of the waking *delusions* of the lower animals, none are so common or so obvious as those connected with *fear* or *suspicion*. They occur equally in domestic and wild animals, especially, perhaps, in those habitually subjected to persecution or other forms of ill-usage by man. Hence we find them equally in the dog and horse, and in the fox and wolf. They are not necessarily connected with the senses, though probably they are usually associated with visual or auditory impressions. They take their genesis in morbid fear, morbid fancy, and morbid suspicion.

The early stage is usually mere unreasonable, unfounded dread, leading probably to excessive or unnecessary caution in such animals as the hunted or baited fox, wolf, or wolverene. The development of such delusions—the liability to delusion—stand intimately related to the *constitutional timidity* or nervousness of an animal, and to the nature of its struggle for life. They occur most frequently and readily in animals that are habitually easily startled and frightened, constitutionally timorous and nervous, and living under conditions that give rise to perpetual dread of peril to life.

Fish are startled, we are told, at shadows on water (Watson); and a recent describer of the habits of the Norwegian lemming speaks of them as 'self-haunted fugitives' in their migrations, and asserts that 'a mere cloud rapidly passing over the sun affrighted them' (Crotch).

Nor must we lose sight of the importance of the degree

to which *imagination* is developed in the animal. A highly imaginative animal, especially if imagination be associated with the tendency to fear, and with physical and mental excitability, is always liable to regard *omne ignotum pro terrifico*, to 'make a mountain of a molehill,' to ascribe to simple, harmless, inanimate objects fantastic forms and formidable characters, to transform the bush, tree, fence, post, or stone, that is quite familiar and undreaded in daylight, into some hideous spectre in the defective night-light. Hence it takes fright readily at imaginary peril; hence the singular effects so frequently and so suddenly produced in certain excitable animals simply by objects that are for the moment unfamiliar, with which the idea of possible or probable danger is almost sure to be associated.

Many nervous animals, especially horses, are frightened inordinately simply by darkness, which imagination peoples apparently with the same kind of hobgoblins as it does in the case of the nervous child. It is probable that such horses are quite as imaginative as many high-bred children and women, or as the uncultured peasantry of such countries as Ireland, or even as certain men of the highest culture and refinement. The *imagination* in other animals than man may not embrace the same kind or variety of subjects or ideals; it may not run riot quite in the same directions; but it certainly appears to operate in the same way, and its disorders produce similar effects for weal or for woe—generally for woe.

There is the same kind of difficulty that exists in man in determining when fear, fancy, or suspicion becomes *morbid*. But there can be no doubt as to the character of the extreme forms or degrees of morbid fancy, fear, or suspicion, either in other animals or in man. In the former they constitute or amount to what in man are variously known as *monomania of fear* or suspicion, and *panphobia*—a morbid dread of everything, every other animal, every man. This condition, as well as the minor stages which lead up to it, are discussed in the chapters on 'Mental Derangement,' it being suitable here only to consider the *morbid ideas*—the delusions proper—that are involved.

The condition of morbid *suspiciousness*, and its relation on the one hand, to ordinary fear, and on the other to delusion, to ordinary caution, and to unnecessary self-sought danger, may be sufficiently illustrated by the following account given by Gillmore of the mental condition of the old wild cock turkey of North America. 'His whole life seems to be spent in a state of uneasiness, seeing and dreading danger in every breath of wind or moving object. . . . . I doubt much if a more crafty, suspicious animal can be found in the world. . . . . Not unfrequently this very watchfulness leads to his destruction, for, to avoid an imaginary danger, he runs into a real one.' Leroy gives a similar account of the hunted wolf.

That many animals have distinct *ideas of danger*, first *specialised* in connection with particular forms and sources thereof, and afterwards *generalised* in connection with peril of all kinds and from all sources—with danger in general; and that such ideas are even more apt to become morbid than other classes of ideas, it would be absurd to deny, unless we are prepared to deny their existence in man. Apart altogether from speech and writing, which it has been repeatedly shown afford very feeble and fitful aid in man, we are in both cases—in man and other animals—and in the latter as much as in the former, entitled to *infer* the presence of morbid ideas—that is of delusions—from the behaviour or action of the man or animal. In no other way can we intelligently explain whole series of phenomena in conduct that are otherwise inexplicable—morbid antipathies, conspicuous eccentricities, marked revulsions of feeling, suddenly committed crimes, suddenly developed ferocity or destructiveness.

There is every ground for believing, moreover, that, as in man, delusion may be *artificially* and at will created in other animals by man—for instance, by the use of certain narcotics (Pierquin), a circumstance that is referred to more at length in the chapter on 'Artificial Insanity.'

Delusions—sensory or other—are as likely to occur in the drunkenness of the lower animals as in the *delirium tremens* of man, and delusions of the same kind.

As has been already mentioned, *sane delusions* are readily producible artificially by the use of the mirror, and by other forms of the substitution of pictorial or other representation for reality, all as further described in one of the chapters on 'Animal Errors.'

Other forms of *artificial* delusion, sane or insane, are to be found in man's deception of animals by turning day into night or *vice versâ*, by creating artificial light or darkness. Thus the Korahs lead their Esquimaux dog-teams to believe that the days are longer than they really are, so as to get a greater amount of work from them in a given time on forced journeys. Thus, too, cocks and song birds are led to believe that night is day, and to act accordingly.

And though distinct delusion is not necessarily involved, it is interesting here to bear in mind the singular phenomena of *hypnotism* (mesmerism, animal magnetism, electrobiology or Braidism) in certain animals—for instance, as the result of the simple act of drawing a chalk or other line in front of an attentive animal. The result in question has been observed in animals so different, so far removed from each other in the zoological scale, as ants and birds, in animals wild as well as tame, the latter including the turkey, canary, sparrow, barn-door fowls, chickens, and cocks. Ants refuse to cross what is to man a merely visible line drawn with a pencil or scratched with the finger-nail.

The effect produced by the simple operations of the so-called mesmeriser, whatever they are, is most usually *immobility, paralysis of will*, and of the power of movement, resembling that which so commonly arises from the varied forms of what is generally designated *fascination*, or the suddenly aroused sense of terrible danger. In other cases the effect produced is more a sort of sleep, from which the animal gradually rouses itself, recovers, or awakes; or it is merely apparently dazed for a time; or the bird's eyes may be fixed on the chalk line, and its head appear as if glued down to a given board, floor or table.

Morbid ideation in the lower animals, as in man, involves the formation of erroneous *inferences* or conclusions; and,

though the operation can scarcely be said to be morbid, other animals constantly commit the same kind of *errors* that man does from jumping too hastily at *conclusions*. Such ideational errors are, moreover, as varied and numerous as they are in man.

Youatt speaks, and very properly, of the 'misconceptions' of a shying horse. Blaine tells us of the 'fancifulness' of sick dogs; and there can be no doubt that pet and pampered animals especially are subject to all manner of sudden whims, caprices, fancies or fantasies.

Delusion is sometimes in other animals, as in man, *epidemic*, as I have elsewhere pointed out in describing and analysing the mental phenomena of panic, as illustrated by stampedes of various kinds. As in so many other cases, there is here a groundless sense of danger, an indefinite dread of a peril that is purely imaginary. But it is so rapidly communicated by imitation or sympathy from one animal to another in a flock or herd that it appears simultaneously to affect the whole mass, and leads to a sort of common action too usually of a self-destructive kind.

CHAPTER IX.

STUPIDITY.

In the countless books that have been written to illustrate the sagacity, the intelligence, or the so-called 'instinct' of the lower animals, much is said of their *cleverness*. Their feats of skill are largely dwelt upon with the view of showing sometimes how much more perfect and wonderful in its achievements is animal *instinct* than human reason.

But little, if anything, is said of the *stupidity* of other animals than man. And yet the alleged stupidity of certain animals is so notorious among men as to be proverbial. Certain supposed-to-be stupid animals are regarded as the emblems, as well as the incarnations or embodiments, of stupidity; and their very names are applied by man to brother man as bye-words for folly or foolishness. I allude especially to such animals as the *booby*, *noddy*, and *goose* among birds, and the *ass* (or donkey) among quadrupeds. Before discussing the general subject of stupidity in animals, it is desirable to inquire into the real nature of the alleged stupidity in the four animals just mentioned.

The poor bird that gives its name to the dunces of our schools, to boys, by the way, who by-and-by frequently become, as in the well-known case of Sir Walter Scott, burning and shining lights in the firmament of literature, science, or art—the *booby*—is simply one of the many bird denizens of oceanic islands or rocks, little, if at all, visited by man, that are, therefore, unacquainted with him as an enemy; that have not learned by experience to avoid him; that do not get out of his way, but remain, notwithstanding his presence, placidly on their nests and in their breeding-places, and

that allow themselves to be caught and knocked on the head. Though they see their comrades captured or slaughtered before their eyes, the others do not profit by experience and take to timely flight.

The *noddy* receives its specific designation, *stolidus*, from its alleged stupidity. Like, and frequently, indeed, along with, the booby, it is a native of remote, barren, rocky islets, such as St. Paul's Rocks. Its tameness is of the same character as that of the booby, and is simply ascribable to the bird's being unaccustomed to the presence or person of man (Wild).

This unfamiliarity and its results are better known, however—have been more frequently observed and described—as they occur in other sea birds that inhabit lands, coasts, or islands seldom or never visited by man. Thus the sheath bills (*chionis*) of Kerguelen's Land, according to Dr. Kidder, an American naturalist connected with the Transit of Venus Expedition of 1874-5, showed great *curiosity* instead of getting out of his way, examined him carefully, staring at him in astonishment; and even when captured they showed no fear. 'They would scarcely get out of my way,' he says, 'and seemed greatly interested in my movements. When I sat on a stone, keeping perfectly still, the whole party . . . . came up to examine the intruder . . . . and finally stopped almost in a semi-circle for a good stare. . . . . The whole troop started to follow me . . . . as if filled with curiosity . . . . the birds not all flying out of range, even after the gun had been fired. . . . . Various members of the (ship's) party captured specimens by hand, all that was necessary to attract them within reach being to remain perfectly still. After one had been caught it served as a lure for others. When taken home alive they still showed *no fear*.'

One of the guillemots bears the specific popular appellation 'foolish' from suffering itself, like so many other island-inhabiting birds, to be taken by hand. 'Apparently there never was stupidity equal to that of the birds of St. Kilda,' says a correspondent of the 'Scotsman' (newspaper), writing in August, 1875. They are easily snared by girls. 'A noose is put at the places where they congregate; they

walk into it and are hanged. . . . . But the lesson is not learned by the (hanged) bird's neighbour.' Or, with a running noose at the end of a stick or long pole, the fowler 'takes off each bird in order.' That sort of stupidity, therefore, which leads to easy capture by man, is not confined to the birds of islands uninhabited or unvisited by him, for St. Kilda is, and has long been, inhabited, while the foolish or common guillemot frequents the coasts of Britain itself.

Moreover, such a kind of stupidity, real or apparent, is not peculiar to seafowl nor to palmipeds. It is to be found in a considerable variety of land birds of the most opposite habits and natives of the most different countries. Thus the flamingo is frequently easy of capture, making no attempt at escape (Watson), the result simply of its *ignorance* that man is an enemy to be avoided.

The German Arctic Expedition of 1869-70 found linnets and snow-buntings 'fearless and confiding,' seeming 'to like the approach of man,' so that they 'almost perched upon our noses, and in five minutes allowed themselves to be caught three times. . . . . We were much amused by the confidence of the sand-pipers . . . . coming close to us,' all in East Greenland.

Baden Powell describes the fearlessness and unsuspiciousness of man that characterise the wood hen of New Zealand. Numbers are caught alive in succession with the greatest ease—for instance, by offering to their view any glittering metallic substance. They actually peck at it through the noose prepared for their capture. They have as yet no conception of the nature or object of traps or snares, or of false calls. Nor, however, do they profit by observation or experience, for the cries and capture of their fellows have no warning influence; even the skinned corpse of one of their companions does not act as a danger signal. All this happens in the more remote districts, where the bird is as yet unaccustomed to man and his doings.

It can scarcely be doubted that in the progress of settlement, as the whole country becomes peopled by man, and as the animal itself becomes the subject of his sport or perse-

cution, it will acquire greater general intelligence, including the development of special caution where man or his traps or snares are concerned. It will learn by experience to associate nooses or other traps with capture, and capture with danger to life; it will recognise man as its most dangerous and treacherous enemy; will distinguish his false or imitated call-notes from the real notes of its own fellows; will exercise more carefully its senses of vision and hearing, its observative and reflective faculties; will, in short, duly profit by the lessons which only experience can teach. A similarly striking change of character and habits has already taken place in other New Zealand birds since, and in consequence of, the advent of the European settlers within the last half-century (Buller, Potts).

Another New Zealand bird—the native pigeon—is described as 'the most stupid bird in existence, and never seems to be much frightened at the discharge of a gun, so long as it cannot see who fired it' (Tinné). A third New Zealand bird, now extinct however, is said to have been 'most stupid and sluggish.' Moas 'would quietly allow themselves to be roasted alive without moving,' in the grass and scrub fired by the Maoris for their capture. The Maoris, indeed, have a proverb—'Inert as a Moa' (Judge Manning).

The *geese* of Anticosti deserve their name (of geese), says Rowan, on account of their stupidity. They are described as inquisitive, and no doubt in them, as in so many other animals, *curiosity*, associated with *inexperience*, is apt to lead to fatal confidence in, or fearlessness of, man. As in the case also of the Australian goose, they are thus probably tame in the wild state from unfamiliarity with man, and so are too easy of capture to the real sportsman, who values his game very much according to the kind and amount of trouble he has had in stalking it. According to Gillmore, certain wild geese in North America sometimes showed themselves 'totally devoid of fear, either of the report of my gun or of my presence, and flew frequently within fifteen or twenty yards, in the most leisurely and business-like manner,' to their own destruction.

According to Gillmore also, the Brent geese of North America hover over or about their shot comrades till they themselves are shot, a fatal hesitancy attributable apparently to kindly feelings of sympathy and brotherly love. The same 'foolish want of regard for their safety' is shown by the plover and various wading birds; 'sooner than forsake their dead and wounded comrades' they sacrifice their own lives to the advantage taken of their emotional condition by relentless, unsympathising man.

On the other hand, according to Houzeau and other authors, this same wild or Canadian goose is not always 'such a goose' or fool in human parlance, as it appears to be. It has the sense, at least, to know when it is well off, for instance by joining the domestic goose for the sake of the creature comforts—the food and protection—the latter possesses, and by bringing its wild companions to share for a time, or permanently, the benefits of man's farm-yard patronage.

Houzeau also tells us of a Chinese goose that struck up a violent friendship—at first sight apparently—with a dog; uttered threats of vengeance against any person or other animal offering to interfere with its favourite; pursued a dog that killed its mate; and lamented its dog-companion's temporary absences.

Watson gives instances both of good sense and good feeling in, and of faithful discharge of duty by, the goose. One of his anecdotes refers to a dying goose installing a young one in succession to it as a nurse, implying a communication of her own feelings and wishes, her success in inducing the other to become her substitute, instruction in certain duties, a sense of her own approaching death, and of the necessity of appointing a successor. Audubon describes the phenomena of courtship in the Canada goose, its choice and coquetry, the satisfaction or the reverse of the contracting parties, the shortness of the process in proportion to the age of the lovers, and the retirement from the field of the bachelors or old maids. The 'Percy Anecdotes' give instances of gratitude in the goose. Pasturant flocks of geese in the New Forest, and each member of the flock, know their homesteads and the proper hour each day for

return to them. They recognise and resent the intrusion of strangers ('Science Gossip').

The common goose is 'possessed of great intellectual powers,' says Wood. The gander sometimes does the duty of a dog—as to vigilance—following its master and obeying his commands. The goose shows striking attachment sometimes to man, as well as sympathy in and with his distress, expressing this sympathy by scarcely taking any food during a master's illness (Wood).

The grey lag goose forms equally strange and strong attachments to dogs, sometimes requiring force to separate these curious companions. They live sometimes in the same kennel, the goose sharing the dog's food, and lamenting the absence of a sporting dog on field duty. Geese have been known also to punish, by persistent persecution, dogs that have killed their mates (Montagu).

The German Arctic Expedition found that 'the stupid Northern divers were at all events clever enough to keep beyond the reach of shot.'

Dr. Adams asserts that the stupidity of game birds in North America is leading to their extermination in consequence of their inability to contend with their foes. They exhibit indifference to danger; have no fear of firearms; in order to escape their enemies they smother themselves in snow; to avoid the sportsman they only fly to neighbouring, perhaps the nearest, trees. He ascribes this kind of stupidity —the frequent penalty of which is death—to *defective intelligence*. But this is a sweeping charge to bring against whole genera and species of animals, and it is at least most difficult to substantiate it. How far such an explanation is satisfactory will, however, be better understood after we have considered other cases of stupidity, attributable to mental defect or disorder on the one hand, or believed to be a generic or specific characteristic on the other.

Certain North American grouse are said to sit still on trees quite near to, and in full view of, the sportsman, to be shot down one after another if the hunter only fires always at the lowest bird (Ballantyne).

In the majority of the cases already cited of apparent

stupidity in birds leading to their falling an easy prey to the sportsman, the obvious or probable cause is *inexperience* of, or unfamiliarity with, man, and its result fearlessness of, and confidence in, him: curiosity or inquisitiveness regarding him as a perfectly novel spectacle giving rise to an overpowering sensation of wonder, surprise, astonishment or bewilderment. But there are certain other causes and results of stupidity in birds that have been partly referred to and partly remain to be considered. Thus common crossbills are 'so intent . . . . when picking out the seeds of the cone (of the fir) that they will suffer themselves to be taken by the noose being put over the head.' The common pheasant, too, is said to be 'a foolish bird. When roused it will frequently perch on the first tree, and is so intent upon the dogs as to suffer the sportsman to approach very near' (Montagu).

Spalding has commented on the stupidity of chickens in desertion of, or wandering from, their mother, the result in part, perhaps, of want or loss of filial affection.

The siskin-parrots of New Guinea, when one is killed, descend from their tree-perches to near the ground; and inasmuch as they 'lose all caution, and seem entirely overcome with grief . . . . any number might be killed with ease.' Here we have a strong emotion overcoming natural caution. Jays and pies forget the hiding-places of their bean hoards, and other birds show forgetfulness of the locality of *caches* of food or booty (White). Here, apparently, we have *defective memory*. In certain other cases we have defective vision or hearing, or defective action of other senses recognised by, or yet unknown to, man. Thus the night-jar or fern-owl allows itself to be caught by day simply because of its *imperfect vision*. 'Stupid as an owl' refers, no doubt, to the apparent stupidity of the poor bird by daylight, in which it certainly does not show itself to advantage. The woodcock of North America, too, is stupid apparently if flushed by day, because of its weakness of vision in strong light (Gillmore).

A robin had got into my own house during winter, and was found fluttering in the parlour. The window was thrown open for its escape, but the bird seemed unable to find its

way to this means of communication with the outer air and freedom, and suffered itself to be caught by hand and thrown out of the window. Here its inaction, its stupidity, may have been due to the conjoint influences of cold, starvation, and of dazzlement with the new spectacle of the furnishings of a well-warmed room.

Birds sometimes do not know their own eggs from those of other species or genera, though differing both in size and colour. So that when man experimentally places in a nest one or more eggs of some other species, the sitting bird hatches the whole, or perhaps only the largest and alien ones, which absorb all the necessary heat. This is but one of the many forms of stupidity that are to be found described in the chapters on *Error*.

Hitherto we have taken our illustrations of animal stupidity from birds. But the same kinds, causes, and results of stupidity occur in other animals—both higher and lower—including man himself.

Among the larger quadrupeds the most seriously libelled, in all ages and in many countries, is, and has been, the unfortunate *ass* or donkey. There are few animals that suffer to the same extent from an evil and unmerited reputation—a reputation which, where it is deserved, is virtually and generally the fruit of man's own treatment. Conspicuous among the evil qualities which it occasionally possesses, and which it is popularly supposed always and necessarily to possess, is *obstinacy*, with frequently a spice of maliciousness. But in the majority at least, of cases, this, where it exists—for it does not always do so—is simply the direct or indirect result of man's own injudicious or bad usage of the animal.

There is ample evidence to show that in favourable circumstances—that is when kindly treated, or allowed simply to develop and exhibit its own natural gifts of mind and heart—the donkey is not only a shrewd or sagacious, but a sensitive and affectionate animal. William Howitt, in the 'Animal World,' describes its true or natural qualities—moral and intellectual—qualities that, as in so many other animals, as well as in man himself, may be brought out into

relief by *cultivation*, just as they may be repressed or perverted by *cruelty*. Chateaubriand, too, had a high opinion of the moral character of the donkey, and thus wrote: 'I have a prodigious liking for asses, and have for a long time been their defender.' In the wild state the ass shows such qualities as a sense and use of discipline; while in domestication, when properly trained and kindly used, it displays such powers or aptitudes as—

1. The opening of gates, including the lifting of gate or door latches, by means of its teeth (Watson). 'There was not a gate about the place but he would open it,' says Wood of a certain donkey.

2. Way-finding over unknown country.

3. Sense of danger, with due caution and precautions in its presence.

4. Obedience, perseverance, alacrity, steadiness and regularity in work.

5. General ingenuity in difficulty or emergency.

6. Patient endurance of ill-usage.

7. Affection to its master, expressed sometimes by attempted caresses, by throwing its forepaws round his neck.

8. Behaviour at man's table, partaking of his food and drink, taking tea with him ('Animal World').

In short, it is frequently only too clever for stupid man; and those familiar with its aptitudes, as developed by proper training or treatment, may be disposed to agree with Wood that the ass really 'is one of the most intelligent animals in the world.'

Two other familiar domestic animals of the utmost importance to man share with the ass the reputation of stupidity, to wit, the sheep and the pig. Of the argali or mountain *sheep* of Central Asia, 'the Mongols told us that if they placed some conspicuous object—such as a piece of clothing—to attract their attention, they would remain motionless while the hunter stalked them without difficulty. I myself successfully tried the experiment, by suspending a red shirt on the top of a ramrod, which I stuck into the ground, and in this way arrested the attention of a frightened herd.' Moreover, 'if one of a herd fall lifeless,

its companions remain beside it, regardless of the hunter's approach' (Prejevalsky).

In our own common domestic sheep, the most familiar, and frequently to them very fatal, form of stupidity exhibited, is 'following the lead' of their bell-wether, with utter absence of discrimination, reflection or consideration of consequences. Thus a flock of 100 sheep on an Alpine pasture in the canton of the Grisons, Switzerland, being frightened by the appearance of some vultures, their bell-wether jumped over a cliff and was killed. The whole flock followed, to their own inevitable destruction, with the exception of the last few, who escaped with their lives 'owing to the bolstering formed by the corpses of their silly comrades.'[1] Here we have the effect—or an effect—of *fright and panic*; and a similar result is produced by a similar cause sometimes when a flock of sheep get upon a railway line, and a puffing or screeching engine approaches. Bewildered apparently by the sudden, unexpected, unfamiliar sight or sound, or by both, paralysed perhaps partly by surprise, partly by terror, they fail to make the one or two steps in a direction at right angles to the rails, that would place them in safety, and so are cut to pieces wholesale.

The sheep, according to Baird, has no idea of self-defence—there is utter helplessness—under attack. But he is certainly wrong if he includes, as he must do, the male, the ram in the wild and semi-wild state. Hogg describes the sheep as a stupid animal, but nevertheless gives instances in it of great intelligence, for instance in way-finding.

Youatt dwells feelingly on the mistaken character assigned to the poor sheep. He describes the moufflon in its wild or natural state as intelligent, self-reliant, courageous, even attacking the dog. Its cowardice or timidity is the result, he thinks, of education, association with man, or habit: it is an *acquired quality*, referable to its habitual dread of the dog and of man. Even the common sheep is capable of excitement to fierceness by the dog, and it attempts to frighten or menace it by stamping and whistling. Under the genial treatment of the Eastern shepherd, it

[1] 'Daily Review,' Edinburgh, July 6, 1875.

obeys his call, follows his lead, shows great affection for its young. The attachments sheep form to each other are characterised by their steadiness or permanence.

The *pig*, like the ass, has a native intelligence that may be *developed by education* to such a degree that there have been 'learned' pigs, just as there are and have been learned dogs—pigs able, for instance, to form words from, or with, letters. Where it lives on terms of intimacy with its master, as in Ireland, or among the New Zealand Maoris, when it is treated and trained as a pet or companion, it assumes the position of the dog, becoming thoroughly tame and domesticated, showing its docility, gratitude, affection by following its master as the dog does. Not only has it been taught to spell, but also to point, to find and to retrieve like a dog, and to hunt for truffles (Nichols), and in other ways it has been and may be rendered useful—by reason of its trained intelligence—to man.

The injustice of its evil reputation for headstrongness, perverseness or obstinacy, as well as for personal filth, has been pointed out by Gilpin, according to whom, if the animal is not naturally docile, orderly and cleanly, these qualities can at least be developed in it by proper treatment on man's part. It profits by experience to the extent of becoming artful, as well as sagacious (White), while certain authors attribute to it much talent, natural and acquired. So-called 'sporting' pigs are as fond of sport as dogs are, and in the same way solicit to be taken out for the purpose of enjoying it. Other pigs show great affection for their young, conjugal fidelity, and attachment to persons, recognising friends and protectors. They defend each other resolutely. Their capacity for education and their tractability lead to their becoming useful to man in many ways, for instance, as beasts of burden.

Pigs are sometimes anything but stupid. Thus, while so many animals 'lose their heads' and their lives on being overtaken by railway trains, Jesse gives the following instance of *presence of mind*, of nerve, of the soundest good sense, in sudden and serious danger, in young pigs too. Fifteen of them had got upon a line of rails as a train approached.

Instead of scattering themselves in a stampede as sheep, horses, deer, cattle, buffaloes and other animals do, 'they remained . . . . in line and stood perfectly still till the train had passed over them, and not one was hurt. They appeared to be sensible of the escape they had had, by running back to the field, squeaking and capering with satisfaction.'

In the camel, fox, certain deer, the musk ox and domestic oxen, the capybara, guanaco, and others of the higher animals, the charge of stupidity in certain circumstances is better grounded apparently than in the case of the ass and pig. Nor, indeed, are the most intelligent animals—the dog, elephant and horse, even man himself—free from well-founded charges of stupidity under exceptional circumstances.

Prejevalsky says: 'The intelligence of *camels* is of a very low order. They are stupid and timid. A hare starting from beneath their feet has been known to throw a whole caravan into confusion; and a large stone, or heap of bones, to cause them to bolt altogether. If the saddle or load rolls off its back, it is terrified and runs in any direction, followed by its companions; and when attacked by a wolf it never attempts to defend itself, although one blow from its powerful foot would kill its enemy. It only cries and spits, expectorating the chewed food with the saliva—a proof of the terror which takes possession of it.' 'There is no more stupid animal than the camel,' says Baker. 'Nature has implanted in most animals an instinctive knowledge of the plants suitable for food; and they generally avoid those that are poisonous. But the camel will eat indiscriminately anything that is green; and in a country where the plant exists that is well known by the Arabs as the camel-poison, watchers must always accompany the animal while grazing.' I have elsewhere shown how the same kind of *errors* as to food-selection occur in the ox and sheep.[1]

The musk ox, when visited by the traveller, 'remains as if rooted to the spot, staring at the strange unknown enemy'

[1] 'On the Toot Plant and Poison of New Zealand:' *British and Foreign Medico-Chirurgical Review*, July, 1865, and October, 1868.

('German Arctic Expedition'), just as the peasants of a remote country district in Britain itself gaze at some foreigner whose dress, manners, and tongue are strange to, and therefore astonish, them.

Prejevalsky speaks of 'the stupidity and indecision of the yak.' Of the chinchilla, Molina says its 'extraordinary placidity of temper may possibly be due to its pusillanimity, which renders it extremely timid.' The guanaco has no idea of self-defence (Baird). They are even totally unable to protect themselves when massed in the herd, becoming 'quite bewildered if attacked simultaneously from all sides' (Darwin), circumstances under which man himself, however, even when trained to arms, equally loses his presence of mind. And this helplessness, as in so many other cases, is duly taken advantage of by the astute hunter. Lamont says that it is 'often curiosity, or the paralysis and confusion of fear' in the walrus that leads it to allow itself unresistingly to be shot.

Belt thus comments on the stupidity of certain Nicaraguan deer. 'It is astonishing that the *deer* should be so little afraid of man as they are, after having been objects of chase for probably thousands of years. Sometimes, when one is encountered in the forest, it will stand within twenty yards stupidly gazing at a man . . . . waiting long enough for an unloaded gun to be charged.' In the very opposite climate of the arctic regions, and under the very opposite circumstances of seldom or never before having been objects of the chase, 'at the first shot a herd of approaching *reindeer* will make a spring and then stand terrified.. . . . The reindeer approaches (the hunter) at a brisk trot, full of curiosity, to within a few steps. Indeed, sometimes they come quite close to him.'

Another timid arctic animal behaves in a curiously unconcerned way in the presence of his strange visitor—man. The Greenland hare 'sits as if nailed down in its rocky refuge, however near the hunter may pass to him. . . . . Payer once stood near a hare which was startled by repeated firing, but had confined its flight to a few steps . . . nibbling the moss quietly.' According to Dr. Copeland, of

the German Arctic Expedition, this apparent indifference to man's presence is attributable to *defective hearing and vision.*

The Greenland (or arctic) fox even seeks man's society—'in perfect innocence and without any suspicion.' Our own common fox, usually and properly regarded as one of the most cautious and cunning, sagacious or shrewd of four-footed creatures, having at all times all its 'wits' about it, nevertheless becomes occasionally so bewildered or frightened as to commit the most foolish actions. Thus one found wandering in the streets of Newcastle, described as having been 'in a state of evident indecision,'[1] deliberately ran into a sack whose mouth was held temptingly open for its capture. It may be and has been frightened nearly 'out of its wits' by a steam-engine whistle, the result being that its terror led it, as in the other case, into the very jaws of that danger which, in ordinary circumstances, it would have been so circumspect in avoiding.

Even in the usually intelligent *dog* countless are the instances that might be adduced of its stupidity. Hogg tells us that if a turmoil arise about a farm-house from cows getting among the corn, or hens into the garden, the highly-bred and specially accomplished 'shepherd's dog knows not what is astir, and if he is called in a hurry (to turn out the one or other trespasser), all that he will do is to hark to the hill and rear himself up on end to see if no sheep are running away.' In short, he is possessed of and by one single dominant idea—the care of sheep; and his uselessness in such a common domestic crisis is apparently to be attributed to *defective education*, to the cultivation of his intelligence only in one direction; in other words, it is a striking and suggestive result of the evils of *specialisation* in educational treatment, without due or any regard to the general intelligence, or to the whole psychical nature, moral and intellectual.

Wood mentions a dog of his own that tore a hole in a hedge large enough to admit the passage of itself with a stick carried by the middle in its teeth; whereas a much smaller hole and much less trouble would have sufficed to

[1] 'Daily Review,' December 16, 1874.

enable it to pass with the same stick pulled through endways. Here we have probably simple want of reflection and calculation.

Several sporting dogs lost themselves in a reed-bed fifty yards broad, and were ultimately found there dead. They had made no attempt to escape from their imaginary prison, for escape would have been easy and must have rewarded persistent attempts. Probably from bewilderment they were unable to help themselves in any way—for instance, to food supply. Hence they perished of hunger, the victims, apparently, of their own stupidity. Here again probably, as in the case of the Scotch shepherd's dog above mentioned, we have the result of mere *special*, as contrasted with *general*, training—the cultivation of a certain kind of aptitude, skill, or knowledge compared with general sagacity. No doubt the animals were as excellent sporting dogs—pointers or setters—as the shepherd's dog may have been one of the best of its kind. But the dogs were specially educated only to point game; and while they did this admirably, they were otherwise so stupid and helpless as readily to lose themselves and starve to death in consequence. Such an instance of *way-losing* in sporting dogs must be set as a *per contra* against the wonderful instances of way-finding of which we hear so much now and then.

Again, a master dropped a small parcel on a road. His dog remained behind and watched it for hours—it might have been for days—till it was picked up by the said master. A simple use of its teeth would have enabled the animal to have carried the parcel after and to its master, without any waiting on its own part, and without having given its master the trouble of going back to look for and recover the lost article. But the dog probably was not trained to carry; or it was incapable of dealing properly with emergency; or it showed a want of due reflection. There was certainly an absence of that natural and general sagacity with which the *species* is credited, but which is most unequally distributed amongst the individuals composing it.

Similar helpless stupidity is occasionally seen in another animal of a very different kind, which is usually and pro-

perly regarded as an incarnation of intelligence and industry —the *ant*. According to Huber, certain Amazon ants are so dependent for the supply of even their physical needs and domestic comforts on their *slaves*, that they are reduced to abject helplessness in the absence of the latter, 'being quite unable to provide for their (own) comforts, even in the midst of abundance. . . . . No work whatever was done. . . . . Many had already died' (Pouchet).

The sagacious *elephant* in India sometimes charges railway trains, thereby mutilating itself grievously and unnecessarily, while the rest of the herd look on 'in a dazed and stupid kind of a way' (Wood). But here we have again evidently the result of *inexperience* and *ignorance*. The animal has not yet learned in its own way that the railway engine is an enemy of a kind with which it need not venture to cope.

Various authors have described stupidity as a characteristic of whole *species*, genera, orders, or classes—in other words, according to them stupidity is sometimes a specific or generic character. But it is more than doubtful whether in any of the alleged instances the allegation is true, whether it can be borne out by facts. All fish, for instance, have been described as stupid; and there are apparent grounds for such an assertion or generalisation in certain cases. Thus we are told that the fish of the Gulf Stream—such as rays, bonitos, albicore, flying-fish, parrot-fish, king-fish, Jew-fish, and sun-fish—may be caught from shipboard by 'anything' in the form of a bait, including a shred of scarlet cloth or a scrap of shining metal. For many kinds of large fish a tea-spoon makes a very good 'bait'—for instance, for albicore, in the Pacific, by trolling astern. Sailors often fish with a piece of wood, having tied round it a white rag, 'hanging loose to represent the wings' of a flying-fish ('Chambers's Journal'). Here we have simply a ready liability to being deceived, to confound the imitation and the real, to jump at conclusions without due observation or reflection, all arising, again, from inexperience of man's lures.

But, on the other hand, we know that many fishes, under other circumstances, show great intelligence and affection;

they possess decided moral as well as intellectual qualities; and it would be as erroneous and absurd, therefore, to characterise the class *pisces* as psychically stupid as to do so in the case of the species or genus dog, elephant, ass, pig, goose, or ant.

In none, perhaps, of the many examples above given of alleged stupidity in birds or other animals is there anything like proof of its depending—where it exists—on *low or limited intelligence.* But, considering especially what has been said in other chapters of mental defect and its results, there is no room to doubt that the correlation of stupidity not only with low or limited intelligence, but with what amounts to *mental defect or disorder*, occurs in other animals just as in man. There are among dogs, horses, and certain other animals individuals occasionally that correspond with those individuals in man who by the Scotch peasantry are called 'naturals' or 'feckless,' unable to cater for or protect themselves, and who in other countries are known as 'silly,' 'fatuous,' or 'imbecile,' as 'simpletons,' 'innocents,' 'noodles,' or 'ninnies.' Their mental 'want' is recognised, though its degree may be inconsiderable. In the lower animals such low or limited, defective or disordered, intelligence renders the individual *incapable of education*, and hence unfit for any kind of service to man. Stupidity is further a common result, equally in man and other animals, of the *mental degeneracy* or decay that characterises age; in other words, it is a feature of, if it do not sometimes of itself constitute, what is in man called *senile dementia*, imbecility or fatuity.

Stupidity arises also occasionally from bodily disease, and we have already seen how, and how frequently, it is dependent on *infirmities of the senses* or of sensation. But a distinction must always be drawn between mere temporary *stupor*, semi-stupor, or stupefaction, however arising—as from—

1. Sleep.
2. Reflection.
3. Intoxication—alcoholic or other.
4. Poisoning, or the action of drugs—narcotic or other.

5. Cerebral or other organic or functional disease—such as sturdy:

And more permanent and constitutional stupidity.

The stupidity of semi-stupor is sometimes produced *artificially* or experimentally, for special reasons or purposes, by other animals as well as by man. Thus the now well-known Dr. Russell of the *Times*, in his letters descriptive of the Indian journey of the Prince of Wales in 1875–76, tells us that 'there is nothing which so pleases a captive beast (a tamed elephant) . . . . as to batter one of his free brethren into such a state of stupidity and weakness that he is unable to frustrate the arts of the snarer, who slips the rope and chain round his legs and leads him into servitude.'

Whether and how far stupidity is improvable, *remediable*, or removable depends obviously on its nature and causation. That which is only apparent, which is confined to the young, ignorant, and inexperienced, is probably temporary merely, and will disappear with maturity, knowledge, and experience; while that which depends upon old age, or mental defect or disorder of any kind, may be unimprovable, irremediable, hopeless, and permanent. There is, in point of fact, however, comparatively little of it fortunately of the latter character, and on the other hand, a great deal that it lies in man's power to correct or remove, simply by his own improved behaviour towards, or treatment of, such animals as the ass.

It is of interest to note that animals recognise stupidity not only in each other, but also in man. Parent animals correct the stupidity of their young, which arises mainly from errors of inexperience, ignorance, or thoughtlessness. For when stupidity of what may be called an *organic* or constitutional kind exists—when there is any mental want in one of its offspring—a want that renders the latter less able to fend for itself than its brethren, or unable to do so at all—it is on this helpless member of her family that the animal mother lavishes the wealth of her attention.

On the other hand, sporting dogs not unfrequently detect and show their irritation at the sportsman's stupidity, his dilatoriness or awkwardness (Adams), just as the horse so

often practically protests against, and shows its disgust at, the awkwardness of its rider.

We cannot properly omit at least a reference here to the comparative stupidity of *man*, and its relation to mental imbecility, a subject that is discussed in the chapter that treats of the mental and moral status of savages, and of the idiotic, insane, deaf and dumb, and criminal classes of civilised communities. Monteiro gives illustrations of the 'almost hopeless stupidity of the negro' of Western Tropical Africa—in regard, for instance, to the use of picks, shovels, and wheelbarrows in mining for malachite. He refers this incorrigible stupidity to 'retardation or arrest of development of his intellect'—in other words, to mental defect; and he points out that this mental obtuseness is associated with 'the greatest physical insensibility.' There 'is an inferior physical organisation, accompanied by a corresponding inferiority of mental constitution.' The negro character is distinguished by 'the absence of good qualities, and of feelings and emotions that we can hardly understand or realise to be wanting in human nature.' Of the Africans of British Guiana Dr. Donald writes, 'Natural stupidity borders so closely on imbecility, dementia, and amentia, that it is difficult to say where a normal state ends and an abnormal one begins.'

CHAPTER X.

SUICIDE.

SELF-DESTRUCTION is at least as common, and occurs under as great a variety and under the same kind of circumstances in other animals as in man. It may be divided into two great categories, according as it is—

1. *Accidental*, non-intentional; or

2. *Deliberate*, intentional, the result of choice and consideration, or of impulse.

To the latter class alone, in which a determination to destroy or sacrifice life is implied, the term *suicide* is usually applied in man, though in man and other animals it is quite proper and permissible also to speak of 'accidental' suicide.

Suicide proper—that which involves intention, and frequently plan—occurs in the lower animals under some of the following circumstances:—

1. The animal is almost invariably *old*, and this cause—*age*—may be said to be the most important of all the *causes* of suicide in the lower animals, operating as it does in so many different ways and in almost all cases, either directly or indirectly. For it is age that leads to the sense of decadence of an animal's powers, bodily and mental; to the experience of man's cruelty; to a full knowledge of the trials or troubles of life. The young, healthy animal, like the human infant, is full of life, and its sense of the enjoyment of mere existence is of the keenest. There is no serious drawback to its pleasures; it knows nothing of the rough usage, of the persecution, peril, starvation, exposure, it may have to encounter.

2. The animal may suffer keenly from *wounded feelings*

of various kinds. These feelings include, for instance, simple annoyance or disappointment; with regret or remorse; despair of forgiveness by man—a despair, moreover, that may be utterly groundless and needless; what is called 'broken heart,' from whatever cause arising; disgust and jealousy. Sometimes, as in man, the causes or motives are, or at least appear to us to be, of a very trivial and disproportionate kind. Thus suicide has occurred in the monkey simply on account of correction for faults, just as happens occasionally in the sensitive human child. Frequently the animal has been a pet or favourite of some master or mistress, who has turned it adrift when age and infirmity have overtaken it, and have rendered it no longer companionable. The various kinds or degrees of wounded feeling that may prompt to so serious a step as suicide are mentioned in the chapters on 'Sensitiveness' and on the 'Moral causes of mental defect and derangement.'

3. The animal may suffer rather from *physical* than mental *agony*; it has met with some serious accident, or is the subject of some bodily disease, attended with acute pain, and this pain perhaps has been prolonged, and is no longer endurable; or without what amounts to agony, there may be the misery begotten of long-continued and gradually increasing ill-health—a misery that in man produces a kind of conjointly physical and mental discomfort of an utterly indefinable kind, that too frequently becomes intolerable, and demands its quietus; or it may be simply blind, deaf, or paralysed.

4. There may be conjoint bodily and mental suffering—as in the case of beasts of burden, that are, in spite of their protests, habitually overloaded by relentless, injudicious, inconsiderate man. Here there are not only physical fatigue and all the evils to health begotten of it, but also the sense of injustice, of cruelty, of unrewarded or badly rewarded effort.

5. The animal is perhaps at bay; or from other causes it is in a state of *desperation*, surrounded by enemies or dangers threatening immediate death of a torturing kind, from which enemies or dangers escape seems hopeless.

6. Or it is a *captive*, and insurmountable obstacles are placed in the way of the natural gratification of its imperious instincts, appetites, or passions.

7. It may be affected with some of the forms of *insanity* —especially with that mental depression, despondency, or *melancholia*, that so frequently arises from grief, and so frequently, in man also, terminates in or gives rise to suicide.

8. It has probably suffered for a series of years from *man's cruelty* or ill-usage in some form or other, and very probably also it feels keenly the injustice or ungratefulness of his neglect or maltreatment.

9. Occasionally maternal affection or other kindly or generous emotions lead to useless *self-sacrifice*. Thus the stork perishes by fire rather than desert her young (Houzeau), though she can do them no good by so sacrificing herself.

Whatever may have been the original causes or motives, the results that immediately precede and lead to suicide are or include the following:—

1. Abrogation of the normal love of life or of self-preservation.

2. Choice of a minor rather than of a major evil.

3. Formation of a plan of suicide.

4. Resolution or determination in carrying out that plan, involving—

   a. Repeated effort, if obstacles are interposed.

   b. Refusal of all means of help.

   c. Adoption of efficient means of securing the desired end.

5. Farewell-taking, by look or otherwise, of familiar and loved scenes, persons, or objects.

All these and other preliminaries of suicide in the lower animals may be illustrated by such incidents or anecdotes as the following:

A case of suicide in the dog is given by Morris, as illustrative of man's pitilessness to his worn-out animal dependents. The poor animal was old, infirm, paralysed, useless, an outcast and a wanderer. Prior to its suicide by drowning it was characterised by sadness of look. It obviously pon-

dered its course of action, exhibited for a time hesitancy, but at last came to a decision, and acted upon it with promptness and resolution. It preferred death to its experience of life, and refused to allow itself to be saved.

In another instance, cited by the same author, the dog was old, diseased, distracted with pain. It, too, drowned itself with the utmost deliberation, first casting a last piteous, 'longing, lingering look' at its master, who had suspected it of being affected by, and probably had discarded it for the suspected, rabies.

An old collie (shepherd's dog) in Caithness, troubled with the infirmities of age, including deafness and the loss of teeth, in 1876 committed suicide—here again by drowning. 'Evidently age was a burden to him. The day before the last scene in the drama was enacted, he was observed to take a general survey of the locality he was about to quit for ever—in a very shaky way. He then wended his way over ground familiar to him in his hunting days to the sea-shore—a distance of about two miles—and without taking a longing, lingering look behind he plunged into the sea and expired. The act was witnessed by a number of persons on the shore.'[1]

A Newfoundland dog 'of great age' had its feelings wounded by being scolded, beaten in pretence only by means of a pocket handkerchief, and having a door shut in his face when about to leave a room with his usual companions—a nurse and her group of children. Soon after he was found alive, but with his head altogether or partly submerged in a ditch. He was dragged out. But now he refused to eat or drink, and before long he was found in the same position in the same ditch, but this time dead. He had succeeded in this second determined attempt at drowning, having failed in securing his purpose with sufficient rapidity and directness by starvation.

A dog that had broken both his hind legs lingered on in agony. At length, dragging his mutilated limbs along, he 'sought the nearest pond, and deliberately went into deep

[1] 'Northern Ensign,' July 20, 1876.

water until the water engulphed him. Unable to endure his misery, the poor brute had committed suicide.'[1]

A small dog 'had got its head cut almost open, whether by some malicious person or by accident is unknown. . . . . It ran about a good while, evidently in great agony, and then deliberately walked into the middle of the river, lay down and drowned itself.'[2] Dr. Macdonald[3] describes a mad retriever as snapping in or at the air, or at imaginary objects in it, uttering a melancholy howl, and walking straight into the sea, in which it, too, was drowned. A Havannah dog, in consequence of the irritation of a seton in its neck, 'rushed to the sea, swam out a little distance, put its head under water, and was drowned' (Wynter).

Many other examples of dogs drowning themselves have been published by Wood and other authors.

The dog, then, that commits suicide is generally or frequently a cast-away. It has been expelled from its master's domicile because it is old, diseased, and useless; or it is a city waif, a pariah. It has learned by the bitterest experience what life is; it infers what continued life is likely to be. It sometimes reflects and hesitates a good deal before taking the final step; it may be seen, for instance, intently gazing on the water of a pond or river for hours, days, or weeks before it makes its suicidal plunge, just as so many human 'anonymas' do when contemplating the last sad scene in their unfortunate career. But when the dog has once made up its mind, has chosen a certain and immediate death rather than a prolonged life of persecution, hardship, misery, it becomes blind and deaf to all offers of salvation, resolutely using its paws if necessary to keep itself submerged.

A captive monkey that committed suicide by drowning, prior to the act was noticed to become morose; it refused all companionship, bit viciously, and had a marked fixity and vagueness—as if contemplative—of gaze (Forbes).

An American canvas-back duck used its bill to keep itself submerged till it was drowned, seizing water-weeds

[1] 'North British Daily Mail,' January 5, 1876.

[2] 'Dundee Advertiser,' November 1874.

[3] Writing to the 'Times,' from South Wales in October 1874.

attached to or growing from the bottom of a pond or lake (Gillmore). 'Certain fowls were determined upon suicide, and many jumped deliberately overboard'—on the African lake Albert Nyanza (Baker). Captive birds sometimes poison themselves, apparently preferring death to confinement.

The American stag or deer commits suicide sometimes when seized or attacked by the glutton—by precipitating itself against trees (Pierquin and Watson).

Dr. Bidie has put upon record a very decided case of suicide in the common black scorpion of Southern India, as it occurs, for instance, in Madras. One was placed experimentally in a glazed entomological case and exposed to the sun's rays. 'The light and heat seemed to irritate it very much. . . . . Taking a common botanical lens, I focussed the rays of the sun on its back. The moment this was done it began to run hurriedly about the case, hissing and spitting in a very fierce way. This experiment was repeated some four or five times with like results. But, on trying it once again, the scorpion turned up its tail and plunged the sting . . . . into its own back. . . . . In less than half a minute life was quite extinct.' Another Indian officer confirmed Dr. Bidie's observation subsequently by asserting 'that scorpions do commit suicide . . . . is a well-known fact. . . . . They turn back their tails and sting themselves to death;' for instance, 'when surrounded by a circle of glowing embers,' from which presumably they infer escape to be impossible and death by the torture of burning imminent. Pasley's experiments on scorpions also led to their death by suicide.

A certain trap-door spider of New Zealand combines murder of its young with voluntary sacrifice of its own life. 'It is perfectly clear to me,' says a most intelligent observer and describer of its habits, Rob. Gillies, C.E., President of the Otago Institute, 'that the spider deliberately sealed its nest and starved itself and its young to death. It evidently could not bear to leave its home, for it could have done so easily at any time with its young. The partial marring of its handiwork seemed to have so disheartened it that it sealed itself up in its own ruined house—a broken-hearted architect and builder.'

Those who believe that the lower animals do not and cannot commit suicide simply because they are lower animals —who consider suicide one of the distinctive privileges of man—endeavour to explain away, in such instances of self-destruction as have just been given, all the ordinary motives for suicide as they occur in man. They regard all such incidents as cases simply of 'accidental' death. When a dog deliberately enters a river, the sea, a pond or lake, submerges itself, and is drowned, we are told that it may have had a 'fit,' epileptic or apoplectic. Thus even Dr. Wynter, who must have been well acquainted with the psychology of suicide in man, suggests, in regard to the before-mentioned case of the Havannah dog: 'It is more than possible that the dog had some head disease which terminated in apoplexy, and the suicide was only a fancy of the proprietor's.' Such an explanation is much more improbable, however, than that deliberate suicide was committed; so improbable, indeed, that it cannot be seriously entertained. The supposition of accidental death from fits of any kind does not satisfactorily account for the whole series of phenomena—those which precede or lead to, as well as those that accompany, the suicidal attempt.

In the case of the Newfoundland dog that died in a ditch it is suggested that he may have lain down there to die of 'broken heart.'

Moreover, various of the lower animals commit *murder* from the same sort of motives, and with the same kind of premeditation and preparation, that man exhibits, including the patient waiting for favourable opportunity and the devising of appropriate means. They murder not only each other, but man, from revenge or other obvious motives. We are told, for instance, of the attempted murder by drowning of a bulldog by a Newfoundland one. The latter seized the former, jumped with it into the sea, for a time 'succeeded in resolutely keeping the bulldog's head under water,' and the latter would infallibly have been drowned had it not been rescued by man.

A swan was more successful in executing its purpose, seizing by the neck and drowning by submergence a dog that

contested with it the possession of a bit of bun ('Chambers's Journal').

And it would be strange, indeed, if animals did not also commit self-murder.

No doubt there are numerous alleged cases of suicide among the lower animals, in which there is no proof positive of the intention to destroy their own lives. But how frequently is this the case also in man? Notwithstanding the absence of proof, the presumption is strong in many at least of such cases that suicide proper was committed. Thus it is difficult to regard such a leap as that of a buck elk over a precipice in Ceylon—as both figured and described by Sir Samuel Baker—otherwise than as the deliberate suicide of an animal at bay, preferring one sort of death to another. He looked before he leaped, and he leaped to certain death. He was, we are told, found 'dead, as he had broken most of his bones.'

The dog, too, and even the cat, are not unfrequently 'found dead'—usually drowned—under circumstances that warrant the conclusion that the death was the result of suicide. Thus a cat was found drowned in a pond immediately after the death of a master to whom it had been much attached. It had left the house on his illness a fortnight previously, refusing to enter it again ('Animal World'). The inference was that grief had led to deliberate self-destruction; but the verdict of accidental drowning is, of course, equally permissible.

Cases are constantly occurring, again, of the *sudden* and permanent *disappearance* from home—so that they are never tracked or traced and never again seen or heard of—in which the supposition of suicide is not only permissible, but its occurrence is probable, though not provable. Such disappearances are apt to happen, for instance, in old pet dogs that have been supplanted by younger rivals in the affections and attentions of their masters and mistresses; and it may be added that, in many of these cases, the morbidly sensitive and imaginative animal merely believes itself to be supplanted, to have lost the esteem of its human patrons, their regard being really unabated towards their former

favourite. Such animals, however, when a new dog, cat, or other animal pet is introduced into a house by a master or mistress, apparently survey their position, take a last look at their old home, with all its contents and surroundings, and then summarily desert it, never reappearing, never again being seen or heard of.

Thus an old retriever, unexpectedly finding its kennel occupied by another dog whom its master had bought—in spite of a long-standing reciprocal attachment between it and its said master—at once left its home; paid it, however, a farewell visit, and then disappeared finally, without leaving any trace of what it had done with itself, or of the direction it had taken, if it migrated to a distance.[1]

We have hitherto spoken of suicide in isolated individuals, and from ordinary and intelligible motives. But it occurs also in singular *epidemic* forms, affecting simultaneously sometimes great numbers of animals, under circumstances that leave us in great doubt as to the nature of the influencing forces. That deliberation or resolution is involved is proved by the fact that obstacles naturally or artificially interposed do not deter from the suicidal act. Thus the frost-fish of New Zealand insists on running itself high and dry upon land, even if obstacles are artificially placed in its way—according to Robson, who speaks of its committing 'deliberate acts of self-immolation: . . . it seemed to have set its mind upon landing.' He describes the barracouta as sometimes forcing itself on shore in the same way. In the salmon-producing countries of the North, again, salmon often perish in large numbers by leaping ashore. In all these cases of fish voluntarily sacrificing their lives it may be that they are pursued by formidable enemies, and are under the influence of terror and despair.

Captain Kennedy mentions a shoal of garfish off the west coast of North America, pursued probably by some dangerous fish-enemy, making 'frantic leaps' in their terror, and at last dashing against a ship's boat, rushing headlong on it, 'rattling on her side like a shower of grape-shot, and leaving many of their number dead.'

[1] 'Dundee Courier,' June 8, 1876.

But no such supposition is possible in the case of the Norwegian lemmings, which terminate their migrations, when they survive so long, by drowning themselves in myriads in the sea. Many insects simultaneously commit wholesale suicide in flame of all kinds, by which they are usually said to be 'fascinated;' there is a voluntary act of sacrifice, and yet will and thought in the animals appear to be for the moment paralysed.

Altogether peculiar in its nature is the apparent suicide, by voluntary dismemberment, of various starfish. A correspondent of 'Nature' put about a hundred feather stars and brittle stars into a sponge-bag. 'On reaching home I found that both feather stars and brittle stars had converted themselves into a mass of mincemeat. It would have been difficult to find a single portion of an arm a quarter of an inch long.'

All forms of suicide hitherto considered—whether epidemic or isolated—involve, or appear to involve, *intention* on the part of the animal—a choice of death in preference to life. But there are many other forms of self-destruction in which there is obviously or apparently no desire to put an end to life; suicide is *accidental* or non-intentional. The most familiar illustrations of this form of self-destruction are to be found in the *panics* of horses, cattle, sheep, and other nervous timid animals. I have elsewhere pointed out to what extent and in what forms panic in cavalry horses, for instance, urges them to rush unintentionally upon what is nevertheless certain death.[1] More common, however, is the case of a flock of sheep, frightened by a dog, leaping blindly and heedlessly one after the other, stupidly following their bellwether, into a confined ditch, and perishing there in hundreds, partly by drowning, but mostly by suffocating each other.

Baden Powell describes the headlong rushes into, and the consequent wholesale self-destruction by smothering in, ravines by sheep in Australia. In all such panics we have illustrations of epidemic suicide, but of a non-intentional

[1] In the paper on 'Mental Epidemics among the Lower Animals,' quoted in the Bibliography.

kind, as well as of terror, fright, fear, alarm, in all their degrees.

Self-starvation is a very common form of self-destruction, especially in the dog, as the result of grief. But it does not appear, in the majority at least of such cases, that there is any distinct desire to destroy life; though, on the other hand, there is as little reason to doubt, in other animals as in man, that in many of such cases suicide is deliberate. In most instances grief destroys appetite; anorexia is produced that leads to the refusal of food; neither hunger nor thirst is felt; digestion becomes impaired by abstinence; and marasmus—frequently fatal—is the result.

Monkeys have frequently poisoned themselves—unintentionally, and as the result of *errors of imitation*, curiosity, greed, or indiscriminate or non-discriminating appetite. Imitation of man's operation of shaving has also led to accidental suicide by cut throat of the stupidly imitative animal.

In many forms of *disease*, mental or bodily, accidental self-destruction not unfrequently occurs. Thus, in the 'sturdy' of the lamb, the animal loses its ordinary power of vision; it wanders, becomes entangled in avoidable obstacles, spins round and round, has no sense of danger, and no knowledge for the moment of the significance or results of its actions; hence it gets itself only too readily into fatal dangers (Pierquin).

There are physicians who ascribe all suicide proper in man to *insanity*; who regard the mere act of intentional self-destruction as a proof and phenomenon of mental derangement. And the same kind of arguments that apply to man apply to other animals. No doubt from a legal view-point it is at least inconvenient to regard all suicide as the offspring and indication of mental disorder. But from a medical aspect, on the other hand, much may be said in favour of such an opinion.

Absurd artificial criteria have been established, mostly by jurists, separating insane from sane suicide—such criteria, for instance, as forethought or premeditation; deliberation or fixity of purpose; ingenuity of plan; adequateness of

motive, and so forth. But in truth those who are familiar with human insanity know that all these features may be developed, and be exhibited, in the suicides of persons indubitably of unsound mind in a medical sense. In all cases, whether in animals or man, there is manifest derangement of the powerful instinct of self-preservation, the strong conservative, ever active, principle of love of life. It is a marvellous and morbid change of character, the substitution of weariness of, disregard for, loss of all interest in, life—which prompts to the throwing of it away, instead of that sense of the value of its possession which, under other circumstances, in the same animal, would urge imperiously to all efforts for its conservation.

I have notes of what has been described as—and what appears to have been—true suicide in a considerable variety of animals, including the dog especially, the horse, ass, mule, camel, llama, monkey, seal, and deer; the stork, cock, jackdaw, and canvas-back duck; the spider and scorpion.

Wild as well as domestic animals commit suicide sometimes, under such circumstances as the blindness, deafness, or helplessness of age, or when they have been tortured or persecuted beyond endurance, or in presence of a powerful and relentless enemy from whom escape is hopeless, in which case they become not only desirous but impatient of ending their own sufferings.

The *modes* in which suicide is committed or attempted by the lower animals do not vary so much as in man, simply because their opportunities, and their knowledge of the best means, are less. In the dog *drowning* is by far the commonest mode, if we except self-starvation—obstinate and absolute abstinence from food.

In the case of drowning in the dog, the sagacious animal simply selects the mode to which it has readiest access. Dogs know full well that water will drown other dogs, other animals, and even man himself; and hence their frequent, and frequently successful, efforts to save life by rescue from drowning. In making such efforts the dog must be aware of the risk he runs. It is simply a correct inference from all his knowledge of the properties of water that, if sufficiently

deep, it will drown himself if he so desire; and he obviously does so desire in many cases of suicide.

Poisoning and cut throat occur only in exceptional cases. Strangulation occasionally occurs in accidental cases—in the frantic efforts, for instance, of stalled horses or cattle to escape from their neck-halters or fetters in panic from fire or other causes.

More or less connected with the subject of suicide in them are the following phenomena in the mental history of the lower animals:—

1. The feeling of *ennui* and the suffering from all forms or degrees of the *tedium vitæ*.

2. Sense of *decadence* of the mental and bodily powers, with the results of such a feeling or knowledge.

3. Sense of *approaching death*, and the preparations therefor.

4. *Appreciation of death*—of the distinction between life and death—between living, dying, and death.

5. *Care of the dead*, including respect for them, their removal and burial.

Captive animals of all kinds, including many of those that are house pets, suffer as decidedly, as do so frequently the mistresses of the latter, all the tortures of *ennui*. The monotony of existence begets an irritable or fractious disposition that creates worries out of every trifle. In course of time life becomes tiresome, every necessary duty irksome, every little trial a source of irritation; the animal becomes dispirited; it has no aim and no hope in life, so that it gradually ceases to value it. Pining, indifference, marasmus are common results, and suicide an exceptional one, in cases where depression passes into *melancholia*. Of a voyage on the African Lake Nyanza, Baker writes: 'The *ennui* of this wretched voyage appears to try the temper of both man and beast. The horses, donkeys, and camels are constantly fighting and biting at all around,' while the women were 'daily quarrelling together like bulldogs.'

Unquestionably the dog, for instance, has a consciousness of the decline of its own physical powers, and it acts in various ways upon this consciousness. Thus the old harrier

leaves to its young, eager, impatient, agile offspring the pursuit of the hare, with all the involved doublings and windings, and the exhaustion of following them up; while it waits patiently itself, with the sagacity begotten of experience, at the points where the game is likely, in the course of pursuit, to cross its path or ambuscade.

Sheep-dogs, watch-dogs, and other dogs useful to man become sensible of their physical weakness in age, of their incapacity for the discharge of duty, of their uselessness to themselves or others, of their burdensomeness.

The old cat enters into *partnership* with a younger mouser —the teacher directing the pupil, and both sharing the proceeds. The horse, too, has a sense of loss of strength, wind, fleetness, of the decadence of its faculties, mental and bodily, with age; and hence it ceases its former rivalry in the race, or endeavours to substitute unfair trickery for fair competition.

Many wild animals become aware of their inability to defend themselves or to escape from danger; they see and feel on every hand their increasing and serious helplessness; they know they are ever at the mercy of the young and strong.

Various animals show in various ways that they recognise, both in themselves and others, the *approach of death*; they feel and know themselves to be dying, or they appreciate the indications of hastening dissolution in their fellows or in animals of other species and genera. A sense of the imminence of death leads them to make timely and proper provision for its incidence. One of the commonest of these preparations is the voluntary seclusion or isolation of dying animals. They *retire to die*, frequently having set apart special selected localities in which to die, and in some cases it may be to be buried. It is, indeed, a matter of general belief, founded upon fact, that 'the wounded beast seeks the thickest covert, where it can die undisturbed,' alone, unnoticed. In aquaria shrimps and prawns withdraw under stones to die. The poet Cowper illustrates this familiar tendency of wounded or sick animals to retire to die in the following lines, applied to himself, taken from 'The Task,'

and most appropriately quoted on the monument to his memory in front of the memorial church erected on the site of the house in which he spent the last years of his life, at East Dereham, Norfolk :—

> I was a stricken deer that left the herd
> Long since. With many an arrow deep infix'd
> My panting side was charged when I withdrew
> To seek a tranquil death in distant shades.

Some animals have regular *cemeteries*, to which they retire to die. Thus the llama of South America has its district cemeteries, in or on which its bones are to be found bleaching in great numbers.

Another not uncommon indication and result of the feeling of coming dissolution is the *farewell*, in various forms, taken by dying dogs and cats of their long and well-loved masters and mistresses, and the *bequests* that sometimes characterise the said farewells.

Premonition of death in certain animals—those that are and feel themselves old, infirm, or hopelessly wounded—appears usually to produce a calm resignation; a sense of the inevitable leads to unprotesting acquiescence; no fear of death is shown. But in other animals that are and feel themselves in the prime of youth, or in the full vigour of maturity and health, there is, frequently at least, developed what seems to be a decided *fear of death*, and this fear leads to very active protest against visible preparations for their slaughter. Such a fear and protest appear to be the cause of the bellowings and struggles of cattle taken to the shambles, where the smell of blood and the sight of other animals slaughtered, or in the process of being so, lead the new victims to infer what is the fate intended for themselves. Again, when an elephant succeeds, after many efforts, in extricating itself from a dangerous quagmire or quicksand in which it had accidentally become immerged, it is probably the fear of the death that seemed and was so imminent that causes it to tremble all over, as Wood states that it does.

In a way that cannot at present be explained dogs and cats often have a *prescience* of a master's intentions to shoot or drown them; and this sort of premonition of their pro-

bable fate leads them to seek safety by flight from the house and district—leads, in short, to the kind of sudden disappearance already spoken of in regard to the discarded dog.

Various animals speedily notice and watch with keenest interest, for their own selfish ends, the indications of *dying*, of approaching death, in other animals, and even in man. Thus the vultures of the Himalayas are described as gathering to the number of twenty or thirty round a dying calf or bullock, patiently but observantly watching and waiting for its death. Other animals, however, do not wait for the death of their victim before they attack it. When the whale is sick or dying he is an object of attack to all the shark tribe, for the sake of the coveted blubber. Some animals, again, either wait for death, or attack during life, according to circumstances. Prairie wolves at once detect accident, sickness, or weakness from starvation in the bison; and they either watch him day and night till death occurs, to devour the carcase, or they hamstring him in his feebleness, and then murder the helpless brute by tearing him to pieces (Gillmore).

Various animals recognise *death* itself—the condition of being dead—in others; and they act upon or show this recognition in various ways. They distinguish life from death—at least the living from the dead; they recognise the physical signs of life or their absence; they are aware when they have killed or only wounded their prey. And they act upon their knowledge or convictions; showing terror, for instance, of a sleeping or living enemy, but none, or contempt, for the same enemy dead.

In many cases they first satisfy themselves that death has really occurred; that there is no simulation, no possibility of mistake. They make a regular *diagnosis* of death. This is done by various kinds of *test* or experiment, and is usually resorted to, in all probability, by old, experienced animals, that are aware of the errors which may be committed, and that probably have themselves, and to their cost, on previous occasions committed some of these very errors. They are quite sensible of the risk of mistaking mere *immobility*—which is frequently voluntarily assumed for the

purpose of deceiving and escaping or entrapping an enemy—for the absolute powerlessness and motionlessness of actual death; they know that mere sleep and death have certain features in common, especially this same feature of immobility. But they have to distinguish by certain practical tests between real and simulated death, or between sleep and death.

The she-bear, for instance, makes use of a process of *experimentation* to test the reality of the death of her cubs (Houzeau); she offers them food; leaves, and then calls them; touches them with her paws, and finds them cold, rigid, motionless, indifferent; she makes use of observation, comparison, reflection, experiment. An ouistiti monkey, bereaved of its mate, caressed the body of its companion until convinced of the futility of its caresses (Houzeau).

Various animals, in their uncertainty as to whether their enemy or prey is really dead, make its death a matter of certainty by various means. Thus the elephant, bull or cow, and dog make sure of the death of a fallen foe by trampling upon him till no chance of life remains.

In various ways certain animals show a becoming *care of*, or respect for, their *dead*. The duk monkey carries off the dead and wounded (Cassell). Barbary apes beg for the corpse of a killed companion, and they remove it, probably for burial. Other animals also remove their dead, in all likelihood for the same purpose. For we know that some animals do bury their dead, occasionally with funeral ceremonies. *Burial* of the dead in bees and wasps with *funeral ceremonies*, the selection of graves, committal to the earth with appropriate solemnity, tenderness, or solicitude, have all been described by Watson. Funeral ceremonies of some kind have also been described in various Chinese apes and in the African pongo. Gorillas cover their dead (Cassell). In the dog regular funeral ceremonials would appear also to take place, if we are to credit such an account as the following, given in the 'Animal World,' a magazine that professes to publish only those incidents, of the truth, genuineness or authenticity of which the editor has convinced himself: 'The largest and fiercest dog took the body in its mouth

and started for the woods. The other dogs formed into a regular procession, and in single file followed the body.' They dug a grave, deposited the body in it, covered it with earth, then united in a chorus of howls, and dispersed.

Certain birds, such as the wren, we are told, sing *requiems* or dirges over the graves of their fellows. In one case, narrated in 'Chambers's Journal,' twenty or thirty of these birds took part, the dirge being a mournful twitter—quite different from their usual joyous song. The fact is represented as being so well established, though the incident itself is of rare occurrence, that such a performance is popularly known as 'The Wren's Requiem.'

Instead of care of the dead, many animals show a stolid and marked *indifference*, and this may be of such a character as to lead to their offering every indignity to the dead, or to their preying upon them. Such indifference has been noted in bees by Lubbock; in ruminants and solipeds by Houzeau.

Many animals, again, commit *errors*—of a kind serious frequently to themselves—concerning the nature of immobility: they confound sleep with death, or simulated death with that which is real. Desiring to prey on certain animals, they incautiously allow the wish to be father to the thought that these animals are dead, when they merely appear to be so; they jump too hastily at desirable but inaccurate and unfortunate conclusions.

It is obvious that many animals associate the idea of movement with that of life, and the converse. Hence they draw the inference—frequently erroneous—that absence of movement indicates absence of life. This, however, is a conclusion at which man himself frequently arrives, under similar circumstances, as regards brother man, as well as in reference to other animals—his 'game.' How often does he find it necessary to call in the physician to determine whether or not a given life is extinct? And how frequently—for instance, in cases of drowning and trance—is even the physician apt to be deceived by rigid immobility?

In the dog, in particular, there is a frequent non-realisation of the nature of death—non-recognition of the

fact, as it affects, for instance, a fondly-loved master or his remains; and it shows this non-appreciation of the facts by a variety of behaviour. Thus it sometimes resolutely defends its master's dead body against all comers, however respectful and kindly they may be; it protests against his burial by every means in its power; it would scratch up the earth of the grave, so as to exhume the corpse, if not forcibly prevented; it tries to feed dead masters, and rescues their corpses when drowned, licking them in order to their resuscitation; it sticks to the dead body till burial, and to the grave long after it—even for months or years—fondly but foolishly.

CHAPTER XI.

CRIME AND CRIMINALITY.

CERTAIN animals commit crimes or criminal acts, offences against man's laws or their own, and these *crimes* are of the same nature as those committed by man, and occur under the same kind of circumstances, as the result of the same sort of motives. Illustrations of such offences are to be found especially in—

1. *Theft*—of property or person.
2. *Destructiveness* of property or life.

Theft may be conveniently considered as of two kinds, as in man, according as the articles stolen are—

1. *Useful* to the thief, and of some one particular kind; or—
2. *Useless*, and miscellaneous or heterogeneous.

In the one class of cases the *motive* is usually obvious and intelligible; in the other there appears to be no rational or explicable motive. On the one hand we have to deal with what in man is regarded as a normal *vice*; on the other with the results perhaps of mental *disease*—of that form thereof known in our police and law courts as *kleptomania*.

Thieving or stealing is a common vice in a considerable number and variety of animals, including, for instance—

1. The orang and siamang; the mona, malbrook, diana, cebus, and other *monkeys* or apes.
2. The horse, dog, cat, hare, rabbit, fox, rat, mouse, viscacha, racoon, and other *quadrupeds*.
3. The magpie, jay, jackdaw; pied and other ravens; rook, Indian and other crows, skua and other gulls, golden-crested and other wrens, sparrow, oriole, nut-hatch, eagle,

sentinel butcher bird, wood hen of New Zealand, ostrich, cuckoo, and other *birds*.

4. Certain ants, bees, wasps, the death's head moth, and other *insects*.

But the character of the pilfering, purloining, plundering, robbery, piracy, that occur in animals differing so widely in species and genera, orders and classes, structure and habits, obviously varies greatly.

In the first place, there is the stealing of *useful* articles, of food to satiate hunger, or of materials for nest-building. The hungry dog or cat that harries the larder is in a parallel position to the starving human beggar that helps himself from the tempting contents of a baker's or butcher's shop. In both cases we have the strong motives of hunger on the one hand, and *temptation* on the other. In neither case is the temptation ultimately or successfully resisted, and appetite is therefore gratified. But there are many cases in which such temptation among the lower animals, especially the dog, is successfully resisted, even at the expense of the non-gratification of one of the most imperious of the physical appetites—that of hunger.

Dogs are sometimes so well trained *not only to know, but to do* at all hazards, *the right*—to refrain from doing what they feel or know to be the wrong, in the sense that it is forbidden by their master—man—that even when suffering the pangs of starvation they can, and do, abstain from touching the most tempting food, of which they have been placed—experimentally it may be—in charge, and of which they have the complete command.

Theft, then, of the kind we are now considering, of articles useful to the thief, may be prevented and corrected by proper means. It is further to be noted that there is in such cases a *selection* of suitable articles, the variety of which is therefore limited. The hungry dog and cat confine themselves to the abstraction of game, milk, bread, or other eatables and drinkables, while the nestbuilding bird helps itself to wool or cotton, straws or sticks.

Nor, as a rule, do animals that steal merely useful articles *hoard* or hide them: they usually apply them at once

to their needs, consuming the stolen viands or building into their nests the constructive materials carried off. Nevertheless various carnivorous or other animals—such as the dog, fox, wolf, jackal—conceal *surplus food* by burial—a procedure that has its analogue in the *caches* of meat among savages. Thus the fox hides the fowls stolen one by one from the farm-yard, and the dog buries the bones or meat-joints it has carried off. And many other animals—such as the beaver (Adams and Gordon)—we know, make store depôts of food for future use. Various birds, too, accumulate or hoard building materials for their nests (Jesse).

In marked contrast to this species of theft is another equally common kind that is perhaps of much higher practical interest to man, inasmuch as he frequently suffers—in reputation at least, and all that the loss of reputation sometimes brings—from the pilfering propensities of such notorious thieves as magpies, rats, and monkeys. This second kind of theft consists in the abstraction of *useless* articles of an eminently miscellaneous kind, the abstraction frequently being systematic, ingenious, and carried on for long periods under man's very nose, but without his knowledge, until accident reveals one of the hoards of such thieves. For in this kind of theft hiding and *hoarding* are the rule, not the exception. Large accumulations are formed, and these accumulations are sometimes systematically arranged, sometimes thrown together without any regard to order or classification. These two kinds of hoards may be illustrated by the occasional gatherings of the rat and viscacha.

Professor Silliman has described one of the hoards of the Californian wood-rat. One of these rats, having formed its nest in an empty stove in the room of a house unoccupied for two years, the proprietor of the said house had at last occasion, in making certain repairs, to come upon the said nest, and his report was as follows: 'I found the outside to be composed entirely of spikes, all laid with *symmetry*, so as to present the points of the nails outward. In the centre of this mass was the nest, composed of finely divided fibres of hemp-packing. Interlaced with the spikes were the following:—About two dozen knives, forks, and spoons, all the butcher's

knives, three in number; a large carving knife, fork, and steel, several large plugs of tobacco . . . . an old purse containing some silver, matches and tobacco; nearly all the small tools from the tool closets, among them several large augers . . . . all of which must have been transported some distance, as they were originally stored in different parts of the house. . . . . The outside casing of a silver watch was disposed of in one part of the pile, the glass of the same watch in another, and the works in still another.'

In this singular case, while certain articles had been utilised—for instance, the nails and the hemp-fibre—all the other articles so carefully stored up and classified appear to have been utterly useless to the thief, as was also the analysis or arrangement by the rat of the stolen goods. More particularly is the dissection and separate arrangement of the parts of a watch here inexplicable. But the whole phenomena are comparable with the hoards and doings of the human kleptomaniac, as I have had occasion elsewhere to describe them.[1]

In this rat-hoard it is desirable to remark on the preponderance of bright, glittering, *metallic* objects. In other parts of this book it has been shown that such objects, especially when of silver or steel, exercise a mysterious influence over many animals—fascinate or attract them in an inexplicable way. For the animals do not appear to make any use of them. They simply but sedulously pilfer and stow them away, adding one article to another, without aim and without end. It might be supposed that, in some instances at least, articles of gold or silver, jewellery, coins, or spoons, might become objects of ornament or amusement, playthings to themselves or their young. But there is no evidence that, as a rule, the articles stolen are applied to any such purpose or to any purpose at all. On the contrary, they are usually, like the knives, forks, and spoons in the rat's hoard, simply stowed away, added to the pile. Possibly, nay probably, the accumulators take pleasure in their hoards, just as the human

[1] For instance, in 'Excelsior,' a publication of the Murray Royal Institution for the Insane, near Perth, in the numbers for 1866 and 1872.

miser does. But the magpie or rat, in common with the man, hoards for no rational end: and if the propensity be regarded as *morbid* in the one case, it must be equally so in the other; in other words, the hoards of the magpie and rat are to be attributed, like those of the human miser, to a morbid acquisitiveness or avarice.

The most notorious thief of bright, glittering, metallic articles among the lower animals is the magpie, the pilfering feats of which have been celebrated in the verse of the poet and the fiction of the novelist, as well as in the matter-of-fact narrative of the naturalist. But there are sundry other birds that exhibit the same propensity, and among them the New Zealand wood-hen, which has an evil reputation with the settlers for this class of misdeeds (Baden Powell). Here we have an animal—a stranger to man, with his sparkling coins, wire, tin-plate, and so forth. The bird shows the same desire to possess itself of man's baubles, makes the same kind of open or surreptitious efforts at their possession, displays, it may be, the same covetousness and cunning that many savage races of man do on first coming in contact with their white brother. These human savages help themselves, if they can, to all the movables on board ship, being fascinated by mirrors, cutlery, and jewellery. In the first instance, at least, there is as little *rational motive* for the theft as in the case of the magpie or wood-hen. No doubt in course of time savages learn, by imitation from the sailors, that certain of the stolen articles may be applied to certain purposes, and they may or do so apply them, using wire, coins, or jewels for ornamenting the person. But the monkey—and probably other animals—do the same.

Wood mentions a tame *jackdaw* that stole rings and jewellery or other small movables of any kind from bed-rooms, which it entered by the open windows—a circumstance that should be borne in mind when maid-servants are suspected of, or charged with, the theft or loss of coins or jewellery. For there are many well authenticated cases of such thefts, that were really committed by pet birds, or by rats, having been charged against perfectly innocent servant girls, who have lost place and pay, reputation, and even health and life,

all in consequence of the thievish propensity of some household animal.

The *Viscacha*, again, while its accumulations are as useless, varied, and proportionally large as those of the rat, seems to have a *preference* simply for objects that are hard. Hence there are to be found in heaps about the mouths of its burrows stones, sticks, bones of cattle, hard lumps of earth and thistle stalks (Darwin, Wood). So well known is this theftuous habit of the animal, 'that when an article is lost the loser always goes to the viscacha burrows to search for it' (Wood); and it would be well if man could do the same to the hoards of the rat.

Some animals go further than merely steal articles that are useless: they help themselves, to their own detriment, to those that are *poisonous*. More especially does the monkey frequently do so, while its inquisitiveness and imitativeness lead it to eat or drink the stolen substance, though it should be a paint, a poison, or a drug.

One of the striking features of the theft of useless or mischievous articles is the frequent or usual *incorrigibility* of the habit of stealing. The monkey, if it do not die from the swallowing of a poisonous paint or other substance; the rat, so long as it is not captured; and the magpie, so long as it is at freedom in a house, go on stealing, undeterred by any kind of punishment. They steal apparently for the sake of stealing, not for the sake of the goods stolen. In many cases, at least, there can be no such motive as hunger or starvation, for the animals are duly fed by kind masters or mistresses.

There would appear to be veritable *morbid impulse*, which the animal finds it impossible to resist. All that is required to determine the operation and development of this morbid impulse is *opportunity*, which gives rise to *suggestion*. For as regards other animals, as well as man, we have probably due cause to reflect—as Shakespeare has it in 'King John'—

> How oft the sight of means to do ill deeds
> Makes ill deeds done!

In other words, given the suitable opportunity and theft is committed, not because the articles to be stolen are required, or can be made use of, but simply because a morbid acquisi-

tiveness impels to such procedure, and in some cases such procedure, with the aimless hoarding up of property, begets a certain kind or amount of enjoyment.

An ineradicable propensity to theft Buckland regards as a characteristic of monkeys as a family. A *cebus* monkey of Belt's, 'when anyone came near to fondle him, never neglected the opportunity of pocket-picking,' a form of theft in which the mona, malbrook, and other monkeys are adepts. There is in such cases no sense of crime, guilt, or wrong-doing. On the contrary, like too many of our own human criminals, the animals find their chief amusement in their nefarious practices, and congratulate themselves on their dexterity, quickness, ingenuity, or adroitness.

In all such cases there is the same difficulty as in man in the *diagnosis* between mere vice or crime, for which the thief is *responsible*, because the habit is corrigible; and morbid propensity or impulse, the result, or a form or degree of, mental defect or derangement—in which the habit is incorrigible and the animal or man *irresponsible*. For, as appears in another chapter, *kleptomania*—as such morbid propensity to steal is called—is common as a form or feature of moral insanity in man.

Langstroth remarks that 'some bee-keepers question whether a bee that once learns to steal ever returns to honest courses;' while Lubbock tell us 'Siebold has mentioned similar facts in the case of wasps (Polistes).'

In connection with the mere useless accumulation of property, it may be desirable to interpolate a few remarks on the sense of *property* and possession exhibited by many animals. They show how they value, and they defend, their proprietary *rights* in a great variety of ways—for instance, in their—

1. Competition for prizes, such as the possession of—
   - *a.* The female.
   - *b.* Food, prey, or booty.
   - *c.* The trappings or insignia of rank.
2. Territorial districts and their boundaries.
3. Nests or other dwellings, and their materials of construction.

4. Capture of prisoners and making of slaves or servants.

5. Storage of provisions.

6. Care of females, eggs, the young, old, or helpless.

7. Claims made by pet animals on man's attentions, or even on man's very person.

8. Charge of man's goods, including his children.

9. Knowledge and use of personal attractions, powers, or aptitudes, including physical strength.

10. Restoration of stolen goods.

11. Detection of theft by man, and discovery and recovery of articles abstracted by him.

12. Use of money.

Not only, however, have many animals certain *rights* of property, which they assert and defend among themselves or against man, but the dog, at least, recognises and respects *man's* proprietary rights. Thus the dog that catches a run-away pony holds the latter by the bridle only till the master of both makes his appearance, when his lawful property is at once resigned to him. The same occurs when a dog, elephant, or horse guards or watches an infant; their duty ceases the moment the human nurse, mistress or master, is forthcoming. Moreover, certain dogs distinguish the property of different members of a family, as well as the belongings of different parts of the person of each (Watson).

There are certain other forms of *theft* among the lower animals that deserve a brief consideration here. One of the most interesting of these is the *abduction of the young* of other individuals, belonging, it may be, to other species or genera, by bereaved or barren females. And it is a theft, moreover, that sometimes has serious consequences to the abducted young; for in the case of sterile females—bitches and mares—there is no milk-supply on which to bring up these unfortunate foster-young, and they necessarily perish (Pierquin).

A bereaved bitch sometimes steals the pups of some other bitch, or the young of some other animal—for instance, kittens—and suckles them, bringing them up as tenderly as if they were her own. This she does obviously for the gratification of her imperious maternal instinct. The object

or motive is intelligible; the cause may be regarded as physiological or pathological; the result beneficent; but the action is nevertheless a theft. The cat and the fox have done the same with dog-pups (Jesse), and many other instances are given in the chapter on 'Foster-parentage.'

Many animals, like many men, take a mean and *dishonest advantage* of the labours of others. Some, indeed, virtually live by robbery or piracy. Thus gulls derive their family name *Laridæ* from their living by habitual theft (Baird), by making other sea-birds disgorge the fish they have had the trouble of catching. The eagle with the osprey, the sparrow with smaller or weaker birds, act on the same principle as the robber skua (gull)—that is, they allow other birds to take all the trouble of capturing prey, and then abstract it by violence from the direct or original captors (Wood).

An equally familiar form of taking a selfish advantage of the labours of others is the *usurpation* by the cuckoo of the nests of other birds, a usurpation attended usually with forcible ejection—virtual murder—of the builders, and consequently legitimate occupants, of the said nests. The sparrow is prone to usurpation of the same kind, as well as to other forms of theft (Wood).

A species of ant (*Pheidole*) receives its specific name—*plagiaria*—from its habit of plundering the nests of other families, genera, or species (Darwin): and various other ants rob the ant-hills of other species or genera of their larvæ or nymphs (Figuier).

Among dogs, as among men, there are lazy, mean individuals who attempt to domicile themselves on the industrious or well-behaved (Cobbe).

The capture and use of *slaves* has, as in the abduction of young, an *intelligible motive*, while the result is, usually at least, beneficent to the captured animals themselves. In various ways they are made useful to their masters or captors. But this usefulness is not only compatible with kindly usage, but it is in fact brought about by such treatment. Even for their own selfish ends, for the sake of the labour, the attentions, or the produce of the captives, the captors find that *kindness* is their *best policy*, as it is man's towards

all subject animals. Ants, therefore, when they capture and make slaves of other species or genera, and use these slaves as nurses to their young, assist these slaves at their work, thereby encouraging them, and join in their amusements, thereby showing their sympathy and friendliness (Houzeau).

Ants, like the Portuguese, make slaves of black species, genera, or races; but the treatment of slaves by the insect and human master is suggestively and strikingly different. Ants and bees also capture and keep as equivalents of *milk-cattle*, for the sake of the saccharine fluid they yield, *Aphides* and other insects. And here, again, the treatment of the servant by the master is kindly and judicious. Indeed, it is difficult to believe that under any other *régime* could ant-slaves or servants be induced to do the work they do for, or confer the benefits they confer upon, their captors, considering the many favourable opportunities they must possess for rebellion or escape, or simply for refusal to give up, even to secrete, their honey dew. Questions of property in, or possession of, these aphides now and then arise, are discussed, and rights are disputed, contending claims being determined by the power of the strongest; in other words, the possession of flocks of aphides becomes sometimes a *casus belli* among ants (Houzeau, Figuier).

Various animals *cheat*, defraud, or extort from each other or man, as in the case of a toll-keeper defrauded of his toll by a dog (Watson). They become *traitors* also to trust—accept *bribes* to neglect a duty or desert a charge. Thus the fidelity of the dog is often tempted, and successfully, by bribes to silence—for instance, in burglary. *Burglary* itself has been committed by the monkey, horse, dog, and cat. *Poaching* is another form of theft not confined to man; for the cat, dog, and fox are sometimes notorious poachers.

Rebellions against authority—for instance, on the part of young against that of parents or leaders, is regarded among other animals, as in man, as a crime, and is punished as such.

Many animals, from a considerable variety of motives and under considerable diversity of circumstances, commit *murder*. The dog, elephant, horse, pig, and other animals destroy their young, each other, or man, from such motives

as anger, jealousy, revenge, or from morbid impulse or appetite, or other pathological causes or conditions.

Certain birds—for instance, Indian crows—peck to death their wounded fellows (Watson). Queen bees murder their rivals, according to Huber, who attributes the procedure to irresistible impulse; in other words, he considers it as morbid. The queen also massacres the royal pupæ. Stranger queens are destroyed by sentinel bees. There is a pitiless massacre of drones by workers also among bees (Figuier).

Infanticide, as in man, is not infrequent in the puerperal female, in which case the cause is pathological. At Kattymar, in India, there is a particular race or breed of mares called the 'Pirani Tajan,' 'that persistently kill their young by refusing to suckle them,' says Mr. Fernandez, who had charge of the breeding-stables at the station above mentioned ('Times of India' newspaper, 1875). But the recently-delivered mother is not the only devourer of her own young; for the morbid appetite is sometimes exhibited by the *male* parent—for instance, in the wild hog, lion, rabbit, and perhaps the wolf (Low).

Animals murder *each other* frequently in the fight, however the latter arises, such combats to the death often resulting from erotic excitement, or from rivalry for the possession of the female. Hence the common occurrence of murder among males, and the natural destruction of the weaker by the more powerful.

Elephants, horses, asses, dogs, and other animals occasionally murder man himself, commit veritable *homicide*, in revenge or retaliation, in repayment of some well-remembered injury or insult suffered at his hands.

Animals also frequently *mutilate* each other in various ways or degrees, causing all manner of disablement. Such mutilations are usually the result of bad temper, of fits of passion, of morbid impulse, or of other forms of moral or mental disorder.

The elephant, horse and other animals destroy each other's or man's *property* utterly, or in various degrees, most usually as the outcome of viciousness or of certain forms of mental derangement. Thus the wanton and wholesale destruction

of man's property, dwellings, crops, gardens, by the 'mad' or rogue elephant in India is notorious. In this case, as in many others, a propensity for the destruction of property coexists with a proneness to the destruction of life, both forms of *destructiveness* being essentially morbid in their nature, and attributable to mental disease. This supposition is borne out by the fact that such destructiveness is so frequently aimless: it can serve no good purpose to the destroyer, save that it affords a vent for his fury. And it is interesting here to note that a precisely similar kind of destructiveness occurs commonly among the human insane, and is familiar to the authorities of every lunatic asylum.

But in other cases, destruction of property, like that of life, is the result in other animals, as in man, of what is called a love of *sport*. The wolf, dingo, collie, terrier, frequently destroy both life and property, weasels or rats, simply to gratify their love of sport, or to give vent to their passions (Low); their destructiveness is gratuitous, wanton, malicious, but it only places them on a par with the most highly civilised men—the pigeon-murderers of Hurlingham, for example.

Various animals such as the dog and elephant frequently become *confederates* or accomplices of man in his crimes, in crimes intended exclusively for his benefit. They co-operate with him ingeniously, faithfully, zealously, effectively, in all manner of theft, including shop-lifting, sheep-stealing, highway robbery, poaching, brigandage and smuggling, as well as in certain forms of murder. They act as man's instruments, assistants, or substitutes, as the case may be, frequently playing their part in his absence and without any immediate or direct supervision.

But in all, or at least in most, of such cases, the animal accomplice has been deliberately *trained* to its nefarious work by man, and though he, the man, ought to be responsible for all the results of such training, it will be seen in other chapters that too frequently it is the clever animal assistant that bears the penalty of the crime, while the more astute, selfish and calculating master escapes. The training bestowed develops in animal criminals a high degree of

intelligence, of which they are constantly required to make appropriate use. Thus they convey information to their master by peculiar voice-sounds understood, perhaps even heard, only by him. They communicate their own ideas (Walsh). They understand necessarily their master's words, even his looks and actions. They recognise mere strangers from enemies.

This high intelligence is due, not merely to the special education conferred, but to the close association of the animals with man as his friend and companion, as well as his assistant or servant. Such is the case, for instance with the lurcher—the poacher's dog.

Sir Walter Scott and the Ettrick Shepherd have made us familiar with the history of the sheep-stealing collie, 'Yarrow,' and of other celebrated canine sheep-stealers of the south of Scotland, that figured in its criminal annals. 'Yarrow' avoided committing its master by bringing him under suspicion in any way (Watson), pretending, for instance, not to recognise him if they met in public (Scott).

Animal criminals watch the human guardians of the law, and take advantage of their momentary inattention: in other words, they wait for, and seize at once suitable *opportunity* for their illegal performances or practices, obviously knowing them to be illegal. On the French frontiers dogs are employed in the smuggling of lace, as well as of tobacco.

The following case came to light in Paris in 1874.[1] For a long time various kinds of small wares had disappeared mysteriously from a certain large emporium for the sale of miscellaneous ornamental or fancy goods. All efforts on the part of the quick-witted and observant Parisian detectives had failed to discover the thief. It had never occurred—either to any of the employés, or to the police, all of whom were on the alert—to suspect a dog that had, nevertheless, been frequently seen in the establishment, but which was naturally supposed to have accompanied some customer or customers. At length the mode of theft was discovered by accident by an inspector of police. It proved that the wily

[1] 'North British Daily Mail,' November 26, 1874.

and sagacious animal acted in the employ of a woman, who waited for her canine accomplice in the street some way off. She placed a basket beside herself on the pavement as if fatigued by carrying it; the dog came sauntering or trotting up with his booty concealed in his muzzle; he thrust his head beneath the half open lid of the basket as if in search of provender, and safely deposited in the basket what he had carried in his mouth.

In other large cities, various dogs have assisted their masters—or more frequently their mistresses—in shop-lifting. Thus a case occurred at Memphis, Tennessee, in 1875,[1] in which a dog co-operated with its mistress, who was tried before, and found guilty in, the Criminal Court there. The animal had been trained to steal foods from stores and to convey them outside to its mistress. 'Much trouble,' we are told, and we do not doubt it, 'had been bestowed on his education by a skilful professional thief.'

Animals co-operate also with each other in crime. Thus they make combined or conjoint marauding expeditions, resembling the thievish raids Highland caterans used to make on their English neighbours.

Such an incident as the following illustrates not only confederacy with each other, but ingenuity in the device of means of effecting their object. Certain Indian crows were most desirous of stealing a bone from a dog, and had already made various futile efforts to possess themselves of it. 'At last, after a distinct consultation, one crow hopped off with dejected mien and then unconcernedly approached the dog from behind. Suddenly it seized him (the dog) by the tail, and the dog at once viciously snapped backwards to avenge the insult. In a moment the crow in front flew off with the bone, followed by its able ally' ('Chambers's Journal').

It is not enough, however, to show that many animals commit crimes of the same nature as those of man, and that they do so from similar motives and under similar circumstances. It must also be shown that other animals, as well

[1] Described in the 'Pall Mall Gazette' of January 20, 1875.

as man, are conscious of the *criminality*, the illegality, of their acts, are sensible of the nature and consequences of wrong-doing—of doing, that is, what is forbidden by man.

Now, many of the lower animals show such moral sensitiveness in a variety of ways.

1. Their criminal acts are executed in such a way as to show that they recognise the necessity for *secrecy* and *noiselessness* in all their operations.

2. They exhibit their *sense of guilt* or shame on detection; they make confession of their criminality by look, gait or otherwise.

3. They make ingenious efforts to conceal their crimes by taking precautions against interruption, discovery, detection or capture, removing or destroying the *evidence* of their commission.

4. In some cases they express *regret*, repentance or remorse, and endeavour to make reparation or *atonement*; or they seek *reconciliation*.

The monkey, dog, cat or other expert animal thieves, in proportion to their cultivated general intelligence and special experience, take care that they are *unobserved* when they commit their act of theft, or at least they fancy themselves unnoticed at the time. Hence their actions are stealthy; they do nothing to attract attention, and everything to disarm suspicion, proceeding noiselessly and looking cautiously or furtively around from time to time, to make sure that there are no human or other on-lookers. The smuggler's dog conceals himself from the observation of the human guardians of the law (Low), well knowing that it is his business for the moment to circumvent them. A thievish rook 'pretends to be very busy, and when she imagines that no one is looking on,' commits her theft. 'I have never seen a theft committed openly, probably from the fear of exciting popular indignation' ('Chambers's Journal'), a fact that shows, on the one hand, that in some cases animal thieves are as much afraid of each other, as witnesses of their delinquencies, as they are of man, and that the nature of the act of stealing is not only understood by many animals, but condemned by them. The rat, too, prior to its

depredations, gives a wary glance round to see if it be free from observation (Watson).

Dogs, cats, monkeys and other animals, when caught in the act of theft, show their sense of detection or conviction in evil doing by their abashed, or fear-stricken, sometimes apologetic, look in man's presence: by their shrinking away from before him, their skulking or hiding from him, their avoidance of him in every possible way. Houzeau mentions a siamang that, on detection in theft, stole out of the room. An Indian crow after stealing an egg, eating it and dropping the empty shell, 'slunk away abashed, as if detected' ('Chambers's Journal').

The expression of *shame* is not always confined to the moment of detection; so that it is not the mere annoyance of being found out *in flagrante delicto* that gives rise to the phenomena just mentioned. For dogs at least show their sense of shame sometimes long after the event, and when it is only referred to orally and casually by man in their presence.

Nor is *guilt*, in any form or degree, universally felt. There are many animals, just as there are many men, that are perfectly callous, indifferent, apathetic, non-sensitive. They commit the most cruel crimes without compunction, without any idea of their enormity, or of their being crimes at all. In such cases, as is pointed out in another chapter, there is probably a want of the moral sense or conscience, a moral, if not also intellectual, defect, which renders the animal or man irresponsible.

Young dogs resemble children in their enjoyment of doing what is, and what they know to be, *forbidden*, apparently just because it is forbidden. Hence they manifest evident delight—self-conceit even—in their escapades, their achievements in wrong-doing (Cobbe, Walsh). And, just in the same way, they persist in doing what is forbidden and in that sense what is *wrong*—in other words, they repeat their offence in sheer wantonness, from a spirit of mischief or perversity.

In order to elude detection, 'Yarrow' took a circuitous route home with his booty by night, and other dogs exer-

cise similar circumspection and forethought (Watson). We have already mentioned a pony that closed paddock gates after itself to destroy proof of its having visited forbidden pastures. Monkeys turn keys in doors, without noise, to secure themselves against interruption, discovery or capture. To remove or destroy the traces or proofs of crime, a collie that surreptitiously worried sheep, and so had got its mouth covered with blood, 'walked into the river, dipped his face in the water, and shook his head backwards and forwards until he thought that all traces of his guilt were removed.' Then he went home to his kennel, 'and with the help of his paws put on his collar' (Wood). A cat stole eggs by rolling them off a shop counter; 'if the smash was unheard, she would lap up the yolk, rubbing the shell amongst the sawdust to prevent discovery' ('Chambers's Journal').

The stolen articles themselves are sometimes concealed —as in the case, mentioned by Wood, of the elephant that placed a lot of chupatties—a kind of large muffin—stolen from a native cook, among the leaves of a tree, taking special care that they should be completely hidden.

A dog has been known to feign sleep, in order to escape detection (Wood), and other equally ingenious modes of assuming the appearance of innocence are adopted by the same animal. Langstroth tells us, however, that 'there is an air of roguery about the thieving bee, which to the expert is as characteristic as are the motions of a pickpocket to the skilful policeman. Its sneaking look and nervous, guilty agitation, once seen, can never be mistaken.'

The dog and other animals frequently deal with the bodies of their *murdered victims* as man does: they bury them carefully where they fancy they are not likely to be looked for. Thus, a retriever who had killed a cat—had committed an unprovoked murder—'deliberately took the cat in his mouth, carried it some distance, dug a deep hole behind some bushes, and after depositing the cat therein, carefully replaced the earth, and had he not been observed, there would have been no evidence of the crime' ('Nature'). Again, a dog murdered a duck in a fit of jealousy; he was found before 'a half-filled grave, in which was deposited the

body of the murdered duck. His long hair had become entangled in the thorns of a rose tree, while he was engaged in burying his victim, and fear of detection and reproof had caused him to remain a silent captive for so many hours' (Wood).

In certain cases, the dog or other animals make, or try to make, *atonement* for their thefts or other crimes—in the case of theft for instance, by the restoration of stolen goods to their proper owner; or in the case of a dog, rebuked for greed as to food, by presenting to a starving fellow what itself did not need (Wood). The siamang caught in theft replaces the stolen goods (Houzeau).

There are yet sundry features in the natural history of crime in the lower animals that require passing notice; for instance—

1. The deliberation and determination so frequently evinced.
2. The ingenuity in devising means, including stratagem or *ruse*, and cunning in using them.
3. The patience in waiting and watching for opportunity.
4. Intention or design to deceive or defraud, steal or murder, as the case may be.
5. Knowledge of the consequence of crime—deserved punishment.
6. Audacity.
7. Malice and relentlessness.

A fight between two Polar bears—male and female—in the Zoological Gardens of Cologne, occurred in the autumn of 1876. The female became exhausted, and was then dragged by the male 'into the water basin in the den, and held down till life was quite extinct. He then pulled her out and dragged the body for a considerable time round the den' ('Nature'), perhaps to make sure of her death. Precisely the same thing has been done, or attempted, by the dog, in killing a rival or enemy by drowning: the head of the victim is thrust under water and held there till there can be no doubt of its death.

Certain ravens, desirous of stealing food from a dog, adopted the following successful and simple *ruse*: they

irritated him so as to cause him to chase them to a distance, when they literally 'flew' to his dish, outstripping him of course, and carried off what they had coveted (Wood).

It is not a little curious—we cannot at present offer any solution of the cause of the phenomenon—that the dog, and perhaps other animals, both suspect and detect the criminality and crimes of *man*. Numerous instances have been placed on record of dogs detecting and exposing, sometimes capturing and punishing, human thieves and murderers, theft or murder by man. But there is no evidence to show how their *suspicions* as to the sinister designs or proceedings of the human criminals are aroused. That such suspicions are aroused we have ample evidence, as well as that, as in man, they may be aroused without ground, may even be morbid in their character, begotten by a disordered imagination. It is by no means uncommon, for instance, for dogs to jealously watch every motion of every stranger, especially in relation to their master's movables, objecting with surly or angry protest to the removal of any property belonging to a master. Wood tells us of a dog that pinned to the ground a man who was simply and most innocently picking up from the floor of a room a stray needle; while another attacked a man who helped himself to a ship biscuit. No matter the value of the article, the dog recognised the property in both, and in all similar, cases, as its master's, and it resents—dangerously it may be—any interference with his property in its master's absence.

Certain curious questions occasionally arise in connection with the *ethics of crime* in dogs, cats and other animals that exhibit singular inconsistencies of conduct. Thus a dog has been known to guard, with the utmost honesty, its own master's property, while it did not scruple to steal that of other people. Mrs. Mackellar had a fox terrier that 'when he was very young threatened to become a notorious thief of other people's goods, though he watched ours so faithfully.' A cat never stole anything for herself, 'but she would always do so for any of the dogs.' Another cat stole meat to feed a starving one that had got itself imprisoned in a deep hole (Wood). No doubt we have here a certain kind

of generosity and hospitality, a practical and useful expression of sympathy. Nor is this kind of benevolence peculiar to cats or others of the inferior animals, so called. It is so common in lordly man to be generous with other people's goods or money! Whether, however, either in men or cats, the end justifies the means in such forms of kindness, is a subtle question we willingly leave to the moralist or the theologian.

CHAPTER XII.

PHYSIOGNOMY OF DISEASE.

WHEN the physician speaks of the *physiognomy of disease* in man he refers, not to mere facial expression, but to all those modes of outward physical expression by which disease makes its presence probable or obvious. This comprehensive form of morbid physiognomy is of the utmost value in the detection or diagnosis of human disease. The mere glance at a patient by a physician experienced in the observation and interpretation of the outward expressions or manifestations of the presence of internal disease, of a serious kind, frequently enables him to distinguish the *malade imaginaire* from the real sufferer—to suspect the existence of, by others unsuspected, dangerous mischief. The wise physician does not, however, trust to his first impressions founded on the mere general aspect, or on the facial character, of a patient. He confirms his suspicion, or corrects it, by due examination with the stethoscope, microscope, and test-tube, or other artificial aids to his diagnosis. But, in proportion to his experience as an observer of the language of look and gesture in man, of that language which is non-vocal, and which so frequently characterises disease, will he find his first suspicions abundantly confirmed. I have myself over and over again had occasion to order to bed, for physical examination, persons who were unaware of their own serious condition, and whose state was never suspected by those with whom they were in incessant contact—patients who had none of the ordinary indications of dangerous disease, but who, nevertheless, were in a hopeless, doomed state, life being a matter of but a few weeks longer.

The physiognomy of disease in other animals is not less important than it is in man. More especially is it so in reference to the early detection of those diseases which are directly dangerous to human life—such as rabies and insanity. The important and eloquent physiognomy of disease in the lower animals has as yet met with small, if any, attention; whereas, if the physiognomy, for instance, of insanity, or of other disorders, psychical or physical, in man is important, it must be at least equally so in the case of other animals, where the same kind of assistance in diagnosis is not forthcoming, in consequence of the absence of speech and writing. The whole comprehensive subject of the physiognomy of *insanity* in the lower animals—the facial expression, the facileness or ferocity of look that characterise mental defect, silliness, or weakness, and all the varied forms of mental derangement—have yet to be fully studied. And this is but one important department of the still more comprehensive subject of the physiognomy of *disease*, which expresses itself outwardly in an infinite variety of facial or general motor or other phenomena. In such animals as the dog, horse, and ox the chief outward expressions of serious internal disease—of mind or body, or both—are the following:—

I. Changes in *look*, including—

a. An indefinableness or indefinable strangeness of the character of the eye, look, or gaze; for instance, in rabies (Fleming) or coming insanity.

b. Vacancy and fixity of gaze or stare.

c. Brilliancy and restlessness of the eye, including wildness, fierceness, or fieriness.

d. Immobility, impassiveness, or inexpressiveness of feature or of facial expression.

e. The opposite condition of extreme mobility, incessant feature-change; e.g., in some forms of insanity.

f. Unnatural gloom or gloominess of countenance; with the

g. Opposite state of unnatural vivacity.

II. Changes in *action*, conduct, or habit, including—

a. Eccentric and erratic movements, such as—
Peculiarities of posturing or attitudinising.
Antics or capers.
Gyration; e.g., in the phrenitis of the lamb (Youatt).

b. Awkwardness or clumsiness of movement, including a stumbling, uncertain, precipitate gait.

c. Morbid desire for movement or muscular action, involving—
Restlessness and exaggerated activity of movement.

d. Aimlessness of action—sudden, objectless change of attitude or place, useless bustle, and to-and-fro hurry.

e. Indisposition to, or slowness of, action; indolence or laziness, frequently with a tendency to self-isolation.

f. Loss of the power of maintaining physical equilibrium, e.g., during repose.

g. Various forms of automatic, mechanical, or unconscious action (Pierquin).

h. General violence, outrageousness, or unruliness of conduct, including proneness to assault.

i. General mischievousness.

j. Specific forms of violence or mischief: by—
Biting, in the dog and horse; kicking, plunging, and shying, in the horse.
Tricking and worrying, in the dog; gnawing, in the horse.

III. Changes in the natural *character* or disposition, including—

a. The development either of marked general excitement or depression.

b. Temper-changes also of a marked kind, such as—
Fractiousness in petted or pampered animals.
Peevishness from many forms of ill-health.

General irascibility or irritability, probably leading to—

Pugnacity and quarrelsomeness.

Sullenness or moroseness.

c. The development of various vicious morbid propensities or impulses, including—

Morbid appetite.

d. Perversions of the natural affections.

e. The generation of natural or causeless alarm, associated with a general 'nervousness'; or, on the other hand,

f. The substitution of fearlessness, or a pathological indifference, for natural timidity.

g. Feebleness of will, or total loss of volitional power, involving a general loss of control over the ideas, feelings, propensities, or actions.

IV.—Changes in the usual voice or other *sounds*—in the ordinary forms of language.

V. Changes in the general *bodily* functions, physiological or pathological, such as cutaneous, circulatory, nervous, and muscular disturbances.

VI. Changes in the special *senses* and in the special functions of sensation—in vision, smell, touch, or taste.

VII. Changes in general or special *intelligence*, involving the loss or perversion of faculties or aptitudes, and the consequent development of a non-protective stupidity.

Such stupidity involves—

a. Loss of the love of life.

b. Loss of all ordinary caution.

c. Loss of the power of self-defence against insect or other plagues or enemies.

d. Loss of obedience; non-obedience or inattention to a master's voice, call, or order.

e. Diminished power of observation, calculation, and attention, involving, for instance—

Non-recognition of man or master.

Non-recognition of danger.

Non-avoidance of obstacles or noxious objects.

So numerous and varied are the outward *expressions of disease*, as faintly sketched in the foregoing catalogue, that it is obviously impossible, in a single chapter, to discuss them *seriatim*. Nor is this at all necessary or desirable, for two reasons: (1) that many of them have already been referred to in other chapters, particularly those concerning insanity, its symptomatology and etiology, and those on language; (2) that many others are not of a character falling within the scope of this work to discuss, belonging rather to comparative pathology than to comparative psychology. But it is proper here to make further allusion to some of the varied forms of the *language of disease*, adding certain general observations of a practical kind.

The *eye* frequently betrays the varying shades of mental excitement, whether such excitement occurs in the transient form of anger, passion, rage, or fury, or in the more permanent and serious condition of mania. The so-called 'fierceness' of eye is frequently, if not always, a bloodshot state, the result of sanguineous engorgement—a condition, in other words, of local congestion. *Staring, glaring* eyeballs or eyes are a frequent indication or concomitant of insanity. But mere rage also is expressed by the glistening or glaring of the eye—e.g., in the lizard (Darwin). The dog's eye is not less expressive of disease or pain, mental or bodily, than of pleasurable emotions. Youatt refers to the 'savage' look of the wretched, ill-used pariah dogs of Eastern cities. Veterinarians speak of the anxious, worried, wild eye or look of the shying horse. The eye of various animals may show melancholy as well as ferocity: it becomes dull, dead, sad. A 'melancholy' look, the outcome of a corresponding mental feeling, has been described in the dog, ape or monkey, and many other animals. The 'look of despair' is a precursor sometimes of suicide in the dog, just as it is in man (Cobbe).

Sympathy with man's sufferings sometimes causes 'sadness' of countenance or look in the dog (Low)—a kind of sadness that is begotten perhaps of sadness of thought, as well as of mere emotion. A 'woebegone' expression of countenance occurs frequently after a carouse, from causes

that are presumably in great measure, if not altogether, physical. Brehm describes the 'pitiable' expression of a baboon's face, accompanying headache, after a debauch; as he does also the *grimaces* of drunken apes. A woeful cast of features is exhibited also in griefs of all kinds. Dr. John Brown speaks of the 'sour' or 'glum' look of the dog.

Gravity of look, as of demeanour, is a common indication of disease, actual or approaching, though it is an attribute also of mere *age*. It is an accompaniment of decay of the mental and bodily powers; and it is said, moreover, to be a natural characteristic of certain animals. In the young, however, it may be safely regarded as morbid—as an indication of disease, mental or bodily; and it is a symptom or condition always significant, even in the adult. No doubt experience—especially that of want and persecution—of the seriousness of life will beget it; and where such a cause is readily provable there need be no difficulty in accepting this view of its etiology.

Want of expression in the face or features, impassiveness of facial expression, has been remarked upon in the orang. But the commentator (Büchner) adds to his statement that the said orang's 'features remained always alike . . . . just as those of savages do'—in which case it did not necessarily point to the presence of, or arise from, disease. Grenville Murray draws attention to the occasional want of expression or of expressiveness in the features or facial physiognomy of the dog, as well as to the evil expression of its countenance, both under certain circumstances.

Biting is a habit or action that deserves special attention in reference to its occasional pathological origin and significance. In such animals as the dog and horse it may, as has been shown in another chapter, be a mere act of self-defence, as when either animal is teased by mischievous children, or when the bitch is harassed by her own pups; or it may be quite innocuous, as when the toothless pup bites in play. But, on the other hand, it may possess a serious significance, which is either not properly understood or is perversely misunderstood, in reference, for instance, to rabies. In the dog it cannot be sufficiently borne in mind that the propensity to

bite is not peculiar to rabies; that biting is not exhibited by every rabid animal; and that every biting animal is not necessarily rabid. Biting has, therefore, no symptomatic or diagnostic value *per se* (Pierquin), a fact that ought to be comforting to those timorous people who regard every biting dog as necessarily 'mad' or rabid. Too frequently this tendency to bite is the direct result of man's ill-usage, or of the fretfulness which such ill-usage engenders.

But it is not the less to be regarded on that account. For whatever be the cause or origin of the habit or action, biting by the dog is at all times an important symptom, or, a vice, in itself—one fraught with possible danger to man, in so far as the bite of a merely angry or furious, non-rabietic dog has been known, or alleged, to produce hydrophobia in man (Parkinson). There is nothing either impossible or improbable in the alleged occurrence from such a cause of so serious a mishap, because the bite of man himself, or other animals, in fury or mania—not in a state of rabies—is sometimes fatal in or to other men or animals. The bite of man himself, though it does not here quite appear whether at the time he was hydrophobic, is said to have produced hydrophobia in other men (Pierquin). The salivary secretion both of man and other animals under rage or mania, which may be regarded practically as merely different degrees of what is essentially the same condition, would appear to be, or to become, diseased, poisonous, and virulent when inoculated into or in other men or animals; that is if it be true, as Pierquin asserts, that a bite in either of the mental conditions mentioned, and whether by man or other animals, may lead to tetanus or convulsions as well as hydrophobia.

What has been called in the carnivora the biting 'instinct' becomes strongly developed in various forms of insanity in them (Pierquin). But biting may appear under circumstances of disease or in captivity in animals in which it is not a natural aptitude, e.g., in rabid sheep (Pierquin). And in such cases of course it has a special diagnostic and prognostic significance, exhibited as it is only under abnormal conditions of mind and body.

In the horse, according to Youatt, *crib-biting* may arise

from imitation or idleness, while biting the person may be the result of—

1. Ferocity of temper—there being no provocation.

2. Annoyance or teasing by man—intentional irritation, as well as mere play on his part.

3. A desire simply to attract man's attention (Houzeau).

4. Pretence or make-believe, as in the case of the dog; but in both cases there is the same risk of 'fun' passing too readily into 'earnest.'

Snappishness, the propensity to snap and snarl, literally or figuratively, is a common synonym for bad temper or morbid irascibility, both in man and other animals.

Licking of man's face, hands, feet, or other uncovered parts of the body, though usually innocuous, and a common expression of affection, attachment, respect, confidence, or gratitude on the part of the dog and cat, is nevertheless a practice not to be too much encouraged, because, in certain diseased states, the morbid saliva may readily gain access to man's system through any trivial, perhaps unnoticed scratch or cut, and may thus produce the much-dreaded hydrophobia. It is in fact in this way—by the application of the morbid saliva to, and its absorption by, some cut, scratched, or otherwise wounded surface, some simple abrasion perhaps of man's skin—that the introduction of the rabietic virus frequently, if not usually, takes place.

On the other hand, Houzeau regards the dog's lick as often equivalent to man's embrace, kiss, or hand-shake; it is a friendly, or more than friendly, act of *salutation*. Licking its master's feet by the dog is quite comparable to the Pope's foot or toe kissing by his fellow-men in the Roman Vatican; in both cases it is an act of *adoration*, neither more nor less. In the cat, rabbit, guinea pig ('Animal World'), and domestic animals in general (Houzeau), in many animals besides the dog, licking may mean or indicate sympathy or compassion only; or it may express one or more of many other feelings, such as appeal, confidence, friendliness, respect, submission, or fear.

Worrying is common in various forms of disease, mental or bodily. It is, for instance, one of the concomitants or

symptoms of insanity in the dog and horse, and frequently leads in them to mutilation of person or destruction of life. On the other hand, it may be an expression of mere temper, or it may occur as a diversion and pretence in the puppy. The worrying of sheep by dogs is frequently difficult of explanation on any other supposition than that it is a morbid propensity, the outcome of mental disorder. There is no apparent motive; food is not required; it does not seem mere sport; it may be gratuitous cruelty. This *absence of motive* in the acts of other animals, as of man, affords presumptive evidence that such acts are determined by mental disease.

Proneness to *assault* or attack may arise from a morbid combativeness, and thus be the result of disease. But it is also an occasional expression of the mere sense of strangeness of a visitor, of suspicions, of antagonism or antipathy, or of revenge—all, for instance, in the dog. General *outrageousness* of conduct in domestic animals, previously noted for their docility, is a common expression of acute disease, mental or bodily—such as mania or rabies. Unruliness, however, for instance, in the colt, while it may be the fruit of disease, may also arise from simple temper or vice, from maliciousness or mischievousness, or from fear.

General *restlessness* of body, incessant, objectless moving from place to place, fidgetiness, perpetual motion, is a common result of mental excitement of whatever kind. *Pawing* the ground in the horse may indicate a dangerous degree or kind of irritability, as well as mere eagerness, restlessness, impatience, or weariness at waiting; or its object may be simply to attract man's notice.

Kicking in the horse is another vice, dangerous to man, that is too frequently produced by his own ill-usage. It is the usual outcome of that kind of fidgetiness or irritability, which is the natural product of habitual teasing by man. It is, in short, one of the poor animal's natural means of self-defence against him or other enemies or tormentors. *Plunging*, jumping, prancing, rearing, flinging, all of them dangerous to man, are common expressions of loss of temper under a castigation that is too often injudicious, unjust,

or disproportionate (Youatt). Whether indicating merely a passing anger or fury, or from whatever deeper and more permanent cause arising, such habits render a horse useless for cavalry or other purposes of man's (Pierquin). The mere *shying* of the horse, again, may spring from fear, cowardice, imagination, or delusion, the newness of objects, want of work, playfulness, the memory of ill-usage or accident; or it may occur in age from defective vision, and thus have an organic cause (Youatt).

Antics, capers, or other absurdities or peculiarities of behaviour, attitude or action, may result—and frequently do so—from disease, especially that affecting the brain or its membranes. But they may also arise from—

1. Love, and the desire to please or charm the female in courtship.

2. The mere buoyant sense of life in the young.

3. The exhilaration of release from irksome duty, of the feeling of holiday liberty, as in cart or plough horses on Sundays.

Certain animals give emission to special *sounds* or noises under nervous excitement, or strong emotion. Thus we have the 'death-agony' *scream*. The dog has sometimes paroxysms of 'hysterical screaming' from terror (Cobbe). Its '*bark* of despair' has been described as one of the characteristics of rabies. The *bawl* of excitement that accompanies the furious assault or charge of maddened bullocks in our city streets must be only too familiar. The Chillingham bull bellows its defiance (Aylmer); and by *bellowing* the stag challenges his rival (Darwin). In the moose, ox, and other animals, bellowings are the fruit simply of anger, impatience or annoyance, as well as of rivalry.

Pain is frequently expressed in other animals, as in man, by *yelling*. *Moaning* is an equally common expression of physical suffering and mental grief; and the same may be said of groaning and other equivalent sounds. Indeed, among the kinds of *cries* that are most familiar are those, frequently plaintive ones, of bodily pain or mental distress, that are quite as common as those of joy or satisfaction—for instance, in birds, such as the rook. Parturition in the hen begets an

agitation, excitement, or fury even, all which are indicated by her cry.

On the other hand, there may be an absence of the usual voice-sounds; *taciturnity* may take the place of noisiness. Taciturnity is sometimes an accompaniment of melancholia; occasionally it is said to be a natural characteristic of a species or individual; or it may be both natural and morbid in the same species or individual under different circumstances, as in the lori (Cassell).

The whole phenomena of mental *excitement* are important, in relation especially to the incidence of insanity; for such excitement is often only the first stage of mania. Perhaps the most important feature connected with it is its *duration*. If protracted it is but too apt to become also intensified, in which condition it either amounts to, or passes into, mania.

The 'wildness' of excitement is frequently referred to by writers. Animals are said to be, from very opposite causes, 'wild with excitement;' for instance, young sporting dogs on some of their first expeditions. This wildness expresses itself in a great variety of ways, involving especially many singularities of conduct. 'High spirits,' including an exuberant friskiness and frisking, are sometimes literally the converse of 'low spirits' in the same animal, the two conditions alternating as in man, and both being essentially morbid. On the other hand, unnaturally high spirits in such an animal as the dog may be merely the effect of exuberance of joy. But in such a case, as is pointed out in another chapter [on 'The Moral Causes of Insanity'], there is danger arising from the *excess* of the emotion.

Excitability—the liability to become excited—so common and natural in the young, becomes, as in man, moderated in *age*.

A familiar form of excitement that may be either physiological or pathological, according to circumstances, and correspondingly simply amusing or dangerous, is that of stall-fed cattle on their emancipation in spring. Having been confined during the long, gloomy, severe winter weather to their byres, they are sent out to pasture on some sunny spring day. At first they appear dazed or giddy. But

gradually, as they become accustomed to the change, they give vent to their sudden and unusual sense of exhilaration in what is usually described as a 'mad' careering about their paddocks, their tails flying or flashing in the air. Every spring, wherever there are grass parks and dairy cows, such a familiar sight may be seen. Here the effect produced—the excitement—is partly physical, partly mental. On the one hand there is the sudden change to fresh or pure air, with its stimulating oxygen, as well as exposure to another physical stimulant—that of light—with the opportunity for, and all the invigorating effects of, muscular exercise; while, on the other, we have the sense of freedom substituted for that of confinement and restraint.

Instead of excitement we may, and often do, have the opposite condition of *depression* as an expression of disease. It is frequently marked by, or it leads to, listlessness, impassiveness, inertness, apathy, lethargy, or the following more specific states or phenomena:—

1. Heedlessness of surroundings or events, or even of the animal's own immediate interests and necessities; equal insensibility or non-sensitiveness to physical, mental, or moral influences, to blows or lashes, to a master's entreaties, caresses, orders, or scoldings, to the stings of flies or other insect pests; placid endurance of, or non-resistance to, punishment.

2. Self-isolation from the society of their own species, or man, including self-concealment, seclusion, or hiding in strange places, e.g. by the dog.

3. Loss of appetite, abstinence from food, leading necessarily to emaciation and general debility, and perhaps by marasmus to death.

Enough has already been said in this chapter alone to show that there is the same difficulty that exists in the case of the language of health, in our *interpretations* of the physical expressions of disease. This arises from the fact that the same expression may be the fruit both of healthy and of diseased conditions; and it is not always easy to determine whether, in a given case, we have to deal with health or disease.

Thus the flight of a dog along the crowded streets of a city is not necessarily attributable either to terror or insanity. But this simple and natural action of the animal's is so apt to be misunderstood by an ignorant, superstitious populace, that it is usually ascribed to madness. The cry of 'mad dog' immediately begets persecution: that produces in a timid animal terror and despair, if they did not previously exist; vicious biting is developed in self-defence; and rabies itself, or ephemeral mania, may occasionally really result under such circumstances (Pierquin). The shrieks or screams of rabies may be, and probably are, attributable to delusional alarm. But not necessarily so; for they may spring also from mere bodily pain.

Disease, mental or bodily, may give rise to, or be expressed by—in the first instance at least—some one group of the changes already enumerated as constituting a sort of *language of disease*—that is to say, our attention is arrested at first, or for the time, by some one group, such as change in look, voice-sound, or behaviour. But more usually, and sooner or later, the groups are conjoined in various combinations, so that in the course of any given disease, whether of mind, or body, or both, we have to do with perhaps the whole series of changes in question, which may be developed in any order of precedence and succession.

Thus the morbid mental phenomena of *phrenitis* in the sheep or lamb (Youatt) include, in the order of their development—

1. Change of aspect and habits.
2. Delirium.
3. Fury—variously described as, and amounting to, ferocity, franticness or frenzy, or mania, marked by its suddenness and periodicity, its paroxysmal occurrence—in fits.

The whole series of symptoms is here apt to be confounded with those of rabies.

The morbid mental phenomena of *sturdy* in the same animals, the sheep and lamb, according to Pierquin include both motor and mental peculiarities, viz:—

1. Indifference to, or non-recognition of, the dog and shepherd; passing into general apathy.

2. Look—dull, stupid, vacant.

3. Assaults on both dog and shepherd, including a tendency to *bite*, an obviously abnormal propensity in the sheep.

4. Anorexia.

5. Unsteadiness of gait, with gyration.

6. Death by paralysis, coma, or convulsion.

Most usually there is equal change of aspect and behaviour, of facial physiognomy and muscular movement, in various forms of internal disease in the lower animals. Thus both in rabies and certain forms of insanity wildness or fierceness is expressed equally by eye or look, and manner or actions.

There are certain *bodily diseases* that are apt to be confounded with insanity, from their being preceded or accompanied by the same kind of *mental symptoms*. These diseases include the following:—

1. Acute inflammations of the brain or its membranes, including especially—

   a. Phrenitis, or 'mad staggers' of the sheep; and

   b. The 'frenzy' or 'brain fever' of the lamb, both according to Youatt.

2. Hydatids in the brain, which cause (e.g.) the 'sturdy' of sheep.

3. Various functional disorders of the brain or general nervous system.

4. Acute inflammations of the spinal cord or its membranes.

5. General fevers, such as the various forms of typhus or distemper.

6. General systemic or blood disorders, such as rabies.

CHAPTER XIII.

CAUSATION OF MENTAL DIFFERENCE AND DISORDER.

General Considerations.

As a general rule, the causes of mental difference and disturbance in other animals are the *same in kind* as, though not perhaps equal in number to, those operative in man. Man's peculiar, and especially artificial, habits render him obnoxious to certain disturbing causes, from which most other animals, living more healthy lives, are free; while, on the other hand, there are certain causes that are more powerfully or frequently operative in other animals than in man.

The causes productive of *insanity* in the lower animals are so numerous and varied that it is impossible, in the present work, to do more than merely catalogue them, making comments on a few of them only in order to show their special power or significance.

In man the causes of mental disease are usually divided into—

1. Physical or bodily; and
2. Moral or mental.

And the same classification may be convenient also in regard to other animals. But in either case—in the case of man as much as in that of other animals—such a *classification* must be regarded as purely arbitrary, artificial, and one of convenience. In the majority of cases of mental disorder—both in man and other animals—its causes are *complex or mixed*, partly physical or bodily, and partly moral or mental. Causation is seldom simple; the cause seldom single. Usually there is nothing more difficult in the study of the natural history of insanity, or in the investigation of an

individual case of mental disorder in man, than to determine the exact nature or number of its cause or causes. Frequently, if not generally, causation is *obscure*, uncertain, indirect, not easy of discovery, estimation, determination, or definition. Only exceptionally is it direct, obvious, or demonstrable.

Superadded to an immediate or *exciting* cause, there is generally a *predisposing* or remote one; and this predisposition itself may be of the most complex structure or nature—the accumulated result of qualities—both physical and mental, inherited from a long ancestry. Moreover, the distinction between predisposing and exciting causes is frequently quite as artificial as that between physical and mental, though both sets of terms are equally convenient expressions of provisional opinions, or provisional results of inquiry. What is a predisposing cause in one case, or at one time, may become an exciting cause in or at another, or *vice versâ*.

The *suddenness* of the incidence of a cause has also an important bearing on the results producible by that cause. Thus the suddenness of any unusual noise has much to do with the genesis of fear.

A cause may be external to an animal, and in that case apparent or obvious to man; or it may be internal and pathological, and in this case unintelligible to, or difficult of determination by, human on-lookers, even of a specially educated kind. Causes, however, that are apparently difficult of discovery, and that are overlooked even by the veterinarian, are sometimes sufficiently obvious *if properly searched for*—the most familiar instance of which is mania from intestinal worms in the dog (Youatt and Cobbold).

Naturally a cause may be expected to be operative in proportion as it is prolonged or repeated—in other words, in relation to its *intensity* and *duration*. This remark applies to all classes of causes, whether they are physical—as exposure to cold and heat; mental—as grief or anger; or mixed—as man's cruelty or neglect.

Thus anger, in its intenser forms of rage or fury, may be really 'a short madness,' as the Roman poet calls it. The

mischief it does, whether temporarily or permanently, bears relation both to its *duration* and *intensity*. Maternal affection even is sometimes violent in its intensity, but as limited in duration as it is intense in degree. In other words, its duration is in proportion to its intensity (White).

Given a result and a variety of possible or probable causes, it is frequently difficult, if not impossible, to determine which of these causes is influential, or the most influential. The hamster, for instance, devours its own young, not from need of food, but, as it has been ingeniously suggested by Pierquin, perhaps from want of milk. In other words, he suggests the possibility that the apparently morbid appetite may be really due to an exuberance of maternal love and caution, and not to its coldness or absence. The idea, however, does more credit probably to the heart than the head of the ingenious apologist. It is, at least, a fair sample of the allegation or assumption of possible causes or motives by comparative psychologists in the attempted explanation of puzzling phenomena. The anger roused in the couxio (monkey) by artificially wetting its beard may or may not depend upon its love of personal cleanliness, dryness, or tidiness.

The *multiplicity* of causes in operation in a given result may be illustrated by a great variety of familiar incidents. Thus the fierce fighting which leads to the death of so many animals in rut is due to a *combination* of the separately powerful influences of sexual love, rivalry, and jealousy.

The fear of the Chillingham bull by the horse, as described by Aylmer, may arise—

1. Merely from the unusualness of the spectacle.

2. The glowering of the equally startled and frightful-looking bull; or it may be—

3. A hereditarily transmitted dread of this class of bulls in particular, or of bulls in general.

Again, the horse shows alarm at the presence or approach of a leopard, but it does not appear whether sight or smell is the medium through which the feeling of dread arises. A cat being frightened by a peacock, a sort of terror-mania was the result, involving utter loss of self-possession, fol-

lowed by a permanent timidity, that permitted the animal to feed only in its master's presence ('Animal World'). In this case the unfamiliar alarming object and spectacle—especially the spreading of the gorgeous tail—was associated with the unexpected and startling cry of the beautiful bird in the causation of the result in the cat. In the hare, fox or other hunted animals the effect of incessant alarm and anxiety cannot be dissociated from that of want of food, exposure to the weather, exhaustion of the race for life against horse or hound. In panics during prairie, city, or farmyard fires, terror from the glare or light, the sense of helplessness or despair from the inability to escape from the tether, stall, or stable, the physical pain of being scorched or burned—all combine to 'madden' horses, cows, or other domestic or wild animals.

In many cases it is not easy to determine which of the *senses* is the medium or channel of the impression that disturbs the mind. Thus in the cat bird, frightened by a hare-skin, either sight or smell may have been the sense affected, or both may have been affected in equal or different degrees.

In the production of a given result there is frequently a *combination* or co-operation of causes of different kinds, both *mental* and *physical*. Thus there is both an obvious physical cause—bodily pain, associated with a mental one, terror—in the case of reindeer bit by lemmings, the combined result being that the 'maddened' reindeer plunge, bite, tread, and stamp wildly, unintentionally killing in large numbers the causes of their torments.

From the usual *complexity* of the causation, and the multiplicity of the causes of mental disturbance in the lower animals, the frequent remoteness and indirect operation of these causes, their accumulation and intensification by repeated inheritance, the determination in them of the *etiology of insanity* is attended with the same kind of difficulties as in man.

Often there is no apparent cause of mental derangement. Even insanity is, or appears to be, spontaneous or idiopathic in its origin or growth; or the cause is *trivial* in reality or appearance, inadequate or disproportionate to the result.

Thus the exciting or immediate cause of insanity in the horse is sometimes simply the sight of the conditions under which it has been overworked or ill-used; while accessions of fury in the same animal are occasionally determined by mere touch (Pierquin), just as they are in the rabietic dog by sights, sounds, or other sensations. It illustrates the saying, 'What great events from trivial causes spring,' that the rabbit, dog, cat, sow, and other animals require only the slightest disturbance of themselves or their lairs to lead them to devour their own young (White).

Domestic quarrels, some slight, real or supposed, the presence of some stranger, may develop *cannibalism*, especially in the mother recently delivered. But in such a case we have, along with a trivial exciting cause, a very powerful predisposing one; and the converse also frequently happens, that a powerful exciting cause may suffice when the predisposition is small, or appears to be absent. In the puerperal state of the rabbit and other animals, as is shown in the chapters on 'Physical Causes,' there is a morbid receptivity of impressions on the senses—a *morbid impressionability* or sensitiveness—just as there is also in rabies.

The apparent triviality of causation is frequently remarkable in various forms of insanity, in panics or stampedes, in all degrees of fear and of fury. The immediate cause of abjectness of terror in a horse may be merely a piece of white paper rolling or rustling along the road before the wind in the twilight. But the probability is, in such a case, that the animal is highly nervous, sensitive, or impressionable. Soiling of their fur by young guinea pigs, we are told, may lead to dislike to them by their own mother, and the cause of other singular *antipathies* is even more trivial. The marked liability of captive monkeys to outbursts of passion is connected usually with trivial causation. Thus the couxio (monkey) loses its temper, flies into a rage, at mere wetting of its beard (Cassell). The exciting cause of panic is frequently, though not in all cases, most trivial, so much so that it may be difficult or impossible to discover it; or when discovered, to believe it can have had any influence in the production of results so serious. The same piece of white

paper that startles and alarms one horse and sends it off in a panic-flight may produce a stampede in a whole troop. Here imitation or sympathy comes largely into play in the *epidemic diffusion* of the terror, and of the impulse to flight from an imaginary, utterly undefined danger.

Much fear, especially in panic, appears to be absolutely *causeless* or groundless. Thus Pierquin refers to causeless dread and panic in the sheep. Likings or fancies, as well as antipathies or hatred, fright or fear, delusive panic, and all the forms of insanity may, and do, appear *without* any obvious external, assignable *cause*. That is to say, we cannot, or do not, determine the probable cause or causes.

Causelessness, however, or triviality of cause may be only *apparent*. It may be due to want of proper inquiry or observation, or to man's ignorance of the etiology of insanity in the lower animals.

As in man, the *same* causes do not always operate in the same way in—

a. Different genera and species; in—

b. Different individuals of the same species; or in—

c. The same individual at different times or under different circumstances.

d. They may be hurtful or operative at one time, and innocuous at another.

e. All causes are liable to be modified by individual peculiarities of temperament, disposition, or habit; by idiosyncrasies, physiological or pathological. And hence it is that the same simple cause so frequently produces different results in different individuals.

In other words, the same causes may produce the most *diverse results*. Thus the same poisonous agent or drug begets different classes of mental symptoms in different individuals, and still more in different genera and species. The same terrifying object may produce either—

a. Stimulation of energy, increased action of the mental faculties, leading to regulated flight; or—

b. Confusion of ideas—a state of mental bewilderment, ending in self-destructive follies—of precipitancy, thoughtlessness, or heedlessness; or—

c. Paralysis of thought and action, tending to dangerous, perhaps fatal, inaction.

Thunder occasionally causes panic in menagerie animals, the particular form in which fear shows itself differing in species and genera so different as the tiger, elephant, camel, and horse. Obstacles to the gratification of the sexual passion produce in some animals active excitement in the form of fury, or of mania of the kind described in another chapter as *erotomania*; and in others a melancholic passivity, leading to death by pining and marasmus, by self-starvation and inanition. Again, the tumult of war produced in the street dogs of Paris in 1871 a series of effects described by Gautier. These effects included uneasiness, excitement; the animals were easily scared, and betook themselves to flight in abject terror. But here many causes acted in combination—such as unusual noises and sights; the loss of masters, of homes, and of food; exposure to weather, and the casualties of a siege. On the other hand, the greater tumult of the battle-field has no effect—or, at least, no deterrent effect—on the disciplined charger, or even on the officer's dog that goes deliberately in search of its master through shot and shell, flame and powder-smoke.

Per contra, the most *dissimilar* causes frequently produce the same results—for instance, the same forms of insanity.

The same causes that produce mental, lead also to *bodily*, disorder. They give rise equally to motor and mental phenomena, to physical and mental disease—especially to other diseases of the nervous system than insanity—including, for instance, rabies, chorea, convulsions, paralysis, and delirium, the form of the resultant disorder, both bodily and mental, sometimes being determined by the *age* of the animal.

The fact that the same causes that lead to insanity in the lower animals lead equally to, or are apt to do so, in part at least, to *rabies*, has a special importance in reference to a disease which inspires a greater intensity of popular terror or horror, with a greater amount of popular error, than perhaps any other single disease to which either the human or animal body is subject. Though the proofs hitherto adduced are perhaps insufficient to determine the point, it is

at least probable that rabies is occasionally primary or *spontaneous*; and this probability is supported by the fact that it can be produced *artificially* (Toppolin). Among the causes—other than the bites of rabid animals—that are stated to have produced, singly or in combination, or that have assisted in producing, rabies in various animals, are the following, according to Fleming and St. Cyr:—

1. Mental anxiety, agitation, or excitement.
2. Disappointments, and the emotion of grief produced thereby.
3. The passions—of anger or jealousy especially.
4. Terror, especially if sudden, including the forcible startling or awakening from sleep.
5. Rivalry and fights.
6. Scolds or upbraiding.
7. Nervousness, or nervous irritability, in certain breeds of dogs.
8. Luxurious life; confinement, with its want of exercise; and unwholesome food.
9. Sexual excitement or irritation, including excessive or even natural sexual ardour; non-gratification or incomplete gratification of the sexual instinct; castration.
10. Physical pain—of all kinds.

It is important to bear in mind that *mechanical*, like personal, *restraint* applied by man—e.g., the use of the muzzle in the dog—is apt to produce, especially in hot weather, ferocity, mania, or rabies (Pierquin).

Certain alleged causes are quite as properly to be regarded as *forms* of mental disturbance—for instance, anger, fear, jealousy, ferocity; or they may be causes in certain cases and forms in others. Much depends on their duration as well as intensity. Thus in other animals, as in man, there can be no doubt that *ira furor brevis est.* This statement is specially applicable to the case of emotional disturbance, to all extravagance, exuberance, or excess of feeling, emotion, or passion, whether of an exciting kind, such as joy, or a depressing character, such as grief. Even in their ordinary degrees or forms fear, anger, or other passions or emotions, while described as common causes of excitement

in a great variety of animals—for instance, the cat—are also themselves states of excitement.

The singular likes and *dislikes* of certain animals may rather be said to amount than to give rise to genuine mental disease. The cat-bird of North America has such a dislike for the *Felinæ* that it at once shows strong excitement in their presence. It has no fear of the dog. But it has a marked dread even of the skin of the hare (Dr. Adams)—a morbid imagination probably operating to its mental disturbance. The fear of intruders in mining wasps gives rise, or amounts, to considerable mental excitement. It is morbid: moved by a disordered imagination, a groundless dread, they make repeated examination for supposed or possible intruders, a procedure which, under other circumstances, might be denounced as senseless and useless, amounting to, or indicative of, *stupidity* or *error* (Duncan). The sexual furor readily passes into a true love-madness; desire or appetite gets beyond the bounds of control, especially if its gratification be opposed or prevented, while mania, melancholia, or dementia may result. Maternal love sometimes amounts to, rather than engenders, frenzy in the presence of danger to offspring (Pierquin). Habitual suspicion or suspiciousness, while it paves the way for delusion, is itself usually a morbid mental state.

The question, in short, is very much one of *degree*. Thus anger may exist in all the degrees of irritability or irascibility, passionateness, or excitement: while it is just as apt, as in man, to become excessive, pass beyond control, assume a morbid and dangerous character, and develop or degenerate into ungovernable fury or ferocity, which in its turn is but a stage short of *acute mania*.

Again, supposed causes may be mere *results*, *concomitants*, or *complications* instead of antecedents. Causes and complications, for instance, are apt to be confounded. Coexisting bodily disorders are common, which may aggravate insanity, though they have not originally produced it—for instance, tubercle in the lungs or other parts of the body, exhausting discharges, hydatids or other tumours in the brain.

CHAPTER XIV.

PHYSICAL CAUSES OF MENTAL DIFFERENCE AND DISORDER.

I. Physiological.

As in man, what are called the *physical* causes of mental disturbance are, in other animals, probably on the whole the most frequent and important (Pierquin). But the relative frequency and importance of physical and moral causes in them have yet to be determined; for up to the present time the etiology of insanity in the lower animals has not been adequately studied.

Referable mainly to the so-called 'physical' class of causes of mental difference or disturbance in the lower animals are the following:—

I. Normal or *physiological* bodily changes, including those which are developmental; such as—

Age.	Rutting.
Sex.	Pregnancy.
Dentition.	Parturition.
Moulting.	Lactation.

II. Abnormal or *pathological* conditions, which include—

1. Physical debility or degeneration, however arising; such as from—
   - General ill-health, however induced.
   - Deficient, excessive, or improper aliment—food and drink.
   - Exhaustion—of over-work, of shock.
   - Sleeplessness.
   - Bodily pain.
2. Specific derangements or diseases of—
   - The blood-supply, as to its—

Quantity,
Quality, and
Distribution.
The brain and its membranes.
Other parts of the nervous system.
Various other bodily organs or functions, including especially—
The reproductive.
The stomach and bowels.
The skin and its accessories.
The heart and blood-vessels.

3. The results of the action of poisons and drugs, especially on the brain and nervous system—including the bites and stings of snakes, insects, or other animals.
4. The effects of mechanical injury or irritation, including the presence of foreign bodies, castration, oviposition.
5. The results of consanguinity in alliances.

III. Exposure to atmospheric or climatic influences, including—

Temperature—especially its changes, and the extremes of heat and cold.
Light—especially its absence or deficiency.
Electrical conditions.

IV. All sensorial impressions—especially certain

Colours,	Smells, and
Sounds,	Sights.

Examining in detail the extent and mode of operation of some of the leading causes above tabulated, it has in the outset to be noted that, as a general rule, they play very much the same parts in the production of mental difference, disorder, or decay in other animals that they do in man.

Thus old *age* has the same mental and physical accompaniments in other animals as in man. There is the same gradual decadence of mental and bodily vigour; the same loss of memory and confusion of ideas; the same loss of mental aptitudes or accomplishments; the same tendency to childishness and fatuity; the same degeneration of the

senses and of sensation; the same tendency to blindness, deafness, muscular decrepitude and stiffness of the joints; the same indisposition to fatigue, bodily or mental; the same indifference to former pursuits and pleasures.

The decay of the mental powers—the mental degeneration or weakness of senility—is observable, for instance, in the old, worn-out horse or dog—the racer or harrier. This mental degeneration involves the moral powers where they have been developed to any appreciable extent. Thus in certain old formerly well-behaved dogs there is, as in man, a weakening of the *moral sense*—a yielding to, or non-resistance of, temptation, an indecision of character—equally attributable to gradual loss of *will*.

Not only, however, are the mental infirmities of age in other animals perceptible to man, where he is at all observant; they are felt also by the animals themselves. The *sense of decadence* of physical strength in the horse and dog leads to the cessation of the races or sports in which they used to be engaged. They leave active and fatiguing pursuits to the young, who are possessed of ardour as well as vigour. They prefer to watch and wait rather than pursue, recognising at once the necessity and advantage of 'taking things easy.' The old harrier substitutes cunning for speed.

Age, however, is necessary to the development of the mental powers equally in young animals and in the human infant, though its rapidity and extent vary in different species and genera. The acquisition of such qualities as caution, cunning, wariness, which are obviously the result of painful experience, is gradual, and it is one of the many characteristics of age. The power, or at least the practice, of reflection is developed, as in man, in proportion to age. Attachment to the person of man, or to place, is also a growth of or with age. There is an absence of any such feeling, for instance, in the pup.

On the other hand, in age there is frequently a weakening or loss of the dislikes or furiosity that characterised earlier periods of life—perhaps the greater part of its course—while the violent forms of insanity—such as mania, which

appear in middle life, lose much or all of their violence, and perhaps dangerousness, in age.

This, and certain other mental characteristics of *age* among the lower animals, such as sedateness or demureness, are advantageous both to the animals themselves, to their fellows, and to man. But there are other equally common and prominent features in character or disposition, begotten by approaching senility, of which the same cannot be said, for instance, moroseness, suspiciousness, irritability or irascibility, savageness or ferocity, sullenness, sulkiness or surliness, vindictiveness, distrustfulness, impatience, caprice, ill-temper, touchiness or testiness of temper, readiness to take offence, unsociality, apathy or lethargy, dulness or stupidity, treacherousness, sourness of temper, discontent. In some cases these evil qualities are only too probably the fruits of man's ill-usage, including captivity, perhaps during a series of years; while in others they may be the result of harsh treatment at the hands of younger competitors of their own kind, in that 'struggle for life' which is no less keen among other animals than among mankind, civilised or savage.

The moose is suspicious in proportion to its age, this suspiciousness tending or leading gradually to morbid imagination and *delusion* (Gillmore).

The frequently marked contrast in character or disposition in the same individual in youth and *age* is matter of as daily observation in other animals as in man. Thus Baird and other authors point out that the Barbary ape, the capped ape, the chimpanzee, and various baboons, which in youth are docile, gentle, affectionate to man, mild, placid, playful, good-tempered, lively, intelligent, in age become ill-tempered, fierce or ferocious, mischievous, sullen, morose, intractable, incorrigible, unteachable, untamable, obstinate, not amenable to punishment, dull, troublesome.

Such character-contrasts are as frequent in the dog as in various species and genera of monkeys. The dignified silence and repose of dogs when they grow in years contrast remarkably with the noisy, restless vivacity of their youth. The manners of the parrot and other pet animals, which in

youth are marked by sprightliness, in age are characterised by sedateness or demureness. Sedateness and love of solitariness appear with age in the hare, in place of the friskiness and love of society that marked its youth.

The mental characteristics of *youth* in other animals, as in man, include the following good and bad qualities—

1. *Good:* spirit, energy, activity, agility, ardour or enthusiasm, intelligence, vivacity or sprightliness, playfulness or love of sport or games, animation or liveliness, love of fun and of society, confidence in themselves and man, versatility, flexibility or plasticity of mind, eagerness.

2. *Bad:* forwardness or impudence, mischievousness and love of mischief—including destructiveness, inconsiderateness, haste, rashness or precipitancy, headstrongness, impulsiveness, inexperience, excessive feeling or a tendency thereto, thoughtlessness.

There is a most interesting and intimate connection or relationship between mental change and the development of physical disease, as well as between both and *morbid conditions of the brain* or nerve-substance, observable in the dog or other animals, as in man. This has been brought out of late years by the experimental investigations of various physiologists and pathologists, British and foreign. Thus Dr. Major, of Wakefield, gives a case of the association of irritability of temper, with loss of memory and diminished intelligence, including failure to recognise her master, coincidently with the development of fits, apparently of an epileptic character, and with partial paralysis of the limbs, all in an old terrier bitch, these conditions, moreover, being coincident with senile atrophy or degeneration of the brain. He gives a plate of the morbid appearances in the brain, and remarks: 'In the dog, in old age, decided *pathological changes* occur in the nerve elements of the brain,' and, comparing these with similar changes in man, he goes on: 'It cannot escape observation that the resemblance between them is very great . . . . In both we find a progressive granular degeneration and atrophy of the cells . . . . and the same destruction of nerve branches, while in the neuroglia we have evidence of a similar morbid process.'

Age, as a predisposing cause, sometimes bears an important relation to—it may determine the nature of—certain morbid phenomena occurring from the same immediate cause; it may determine, for instance, whether they shall be motor or mental. Thus in cattle, we are told that convulsions are apt to occur in the young, but delirium in the old, from the *same exciting cause*. In certain other cases age has an indirect, rather than a direct, influence in modifying character. Thus the carnivora change their food with the state of their teeth, and the latter depends upon their age (Houzeau), while, as will become apparent in another section of this chapter, the nature of the *food* itself directly affects both the mental and bodily condition.

There are the same kinds of difference in intellectual power, in mental quality or aptitude, character or disposition, between the *sexes* in other animals, as in man (Darwin). In other words, there is a sexual psychical distinction throughout the animal kingdom, including man, a natural law or fact that is apparently either not known to, or that is conveniently ignored by, the declamatory and clamorous claimants of woman's rights. Just as in man, there are occasional *exceptions* to the general rule; certain animals assume the duties and display the mental characteristics of the opposite sex, either temporarily or permanently. But neither in the case of man, nor of other animals, do such exceptions invalidate the general law or rule. On the contrary, in both cases these exceptions are so rare that they are striking, and at once attract man's notice.

Both in man and in other animals, superior force or strength of character is the attribute of the *male*. It is almost invariably from the males, for instance, that animal leaders are chosen by groups of animals themselves, and this not on account merely of physical strength, but also of mental capacity, of courage, fertility of resource, presence of mind in danger, and other important qualities of mind.

Among the lower animals—notably in monkeys—the male is bolder, fiercer, more pugnacious than the female (Darwin). Among other alleged masculine qualities are to be noted caution, composure, savageness, quarrelsomeness,

noisiness or turbulence, ardour, untamability, ferocity, combativeness.

Ecker states that male horses are most liable to certain forms of insanity. Rogue elephants, so frequently the subjects of the most destructive and dangerous, frequently murderous or homicidal, mania, in whom insanity would seem to be the result of compulsory exile, are always males (Pierquin). The dangerous rivalries and jealousies of courtship are, as a rule, confined to the males (Darwin). It would appear further that the males are the chief sufferers at the period of the *rut*. In deer it is notorious that the annual rutting produces a remarkable change of disposition, whereby ferocity is substituted for gentleness; but it is in the buck—the male—that this change is observed. As a general rule, the season of the rut, the function of rutting is attended in all male animals with irascibility and pugnacity, frequently with furiosity or ferocity of a kind dangerous to the life not only of their own species, but also of man. Other obvious physiological or pathological changes of character occur.

Not only does the timidity of the stag become transformed into boldness or ferocity, but the dog loses its obedience and disregards punishment, while the cat deserts home and lapses into melancholia if confined to the kennel or room. An irresistible impulse to gratify the sexual passion affects even the most placid animals, e.g. the dromedary, while any obstacle to such gratification is always apt to engender either furiosity or a tendency thereto. The dromedary becomes restless, ceases to recognise man, loses its affection for him, becomes dangerous to him from vicious biting, these conditions being accompanied by cries and anorexia, while delirium or mania is occasionally developed (Pierquin). Wholesale deaths of the animals engaged result from the combats of the musk ox in rut (Houzeau), while those of the Virginian stag lead frequently to entanglement of the horns, and death by inanition. On a smaller scale the conflicts of male nightingales in the pairing season are no doubt more generally known.

There are certain singular sexual attractions and repul-

sions most marked again in the case of males. The mere sight or presence of a female is frequently sufficient to develop or determine dangerous mental excitement, sometimes so intense and so uncontrollable as to amount to *erotomania*. It has been stated by Pierquin that while male orangs admire the female sex of man, certain monkeys show an inexplicable antipathy or hatred to woman, and are able to detect her sex though the person is duly concealed by dress.

Again, 'the *males* of almost all animals have stronger passions than the females,' says Darwin,—a general rule which, if established, must have, at least, many exceptions, for there can be little doubt as to the intensity of the passions in females and the frequency of their and its display.

Feminine mental characteristics in other animals, as in man, are supposed to include the following: affection, gentleness, timidity, docility, goodness—whatever that may mean—implying probably, at least, good temper, with greater loquacity or communicativeness. Caprice would appear to be a special attribute of the female throughout the animal kingdom. In the lower animals it is most familiar among the phenomena of courtship, in the female's selection of a mate.

But, in the first place, it is more than doubtful whether the female possesses any greater number of virtues than the male, while it is very certain that, with the frequent assumption of masculine duties, she acquires, for the time at least, the vices that are unfairly regarded as more specially masculine. The converse is equally true: that, with the occasional assumption of feminine duties by the male, he acquires what are usually supposed to be specially feminine virtues.

Assumption by the *female* of male prerogatives is illustrated occasionally in courtship, rivalry, battle, on which occasions there is an unexpected display on her part of pugnacity, boldness, fierceness or fury. And the same mental qualities are frequently displayed as the result of the change of character brought about by *maternity*, in the defence, for instance, of young. The female cassowary and other birds become pugnacious while breeding (Darwin).

Under even what appear to be ordinary circumstances, there is occasionally a *reversal* of the usual sexual mental and moral characteristics, a transposition of the distinctive instincts, habits, dispositions and occupations of the sexes. Thus the female emu is savage, quarrelsome, noisy: it exhibits courage and pugnacity, while the male is docile, gentle and good-tempered. The pugnacity of the female Indian quail is also remarkable (Darwin). The females of one of the Nicaraguan tanagers are bolder than the males (Belt).

Affection for her young is usually supposed to be strongest in the *female*, and probably it is so as a rule. But there are decided exceptions in cases in which, for various reasons, the male assumes the duty of nursing; and in such cases paternal solicitude becomes a prominent, because unusual, feature in his character, contrasting remarkably sometimes with maternal apathy.

The relation of *sex* to work is, as a rule, recognised throughout the animal kingdom by the animals themselves. It is the male that has to forage for, and defend, both the female and her young, while the female has the immediate care of their offspring. It is the male that is called upon to do all work requiring superior strength and courage, as well as composure and presence of mind. Thus the male horse —the stallion—takes all posts of danger and protects the female (Low). It is the duty of the male bird to serenade the female, to cheer or charm her with his song, while it is her prerogative or privilege to accept his loverly or marital attentions (White).

It is noteworthy that there is an intimate *correlation* between sexual *mental* or moral attributes and sexual *physical* characteristics, equally in other animals and man. This is best illustrated by the result of any operation whereby the sexes are placed as nearly as possible on equal footing: by the removal, that is, of distinctive sexual organs. Hence the operations of *castration* in certain animals, and of *emasculation* in certain men, are in their psychical effects most interesting.

In the horse, for instance, *castration* removes in great part the physical sexual difference. But it does not do so

without a remarkable change in its mental character, and it is in order to such a change that the operation is performed. There is a loss of objectionable sexual furiosity or excitement of the nature perhaps of erotomania, and this is what the operator has immediately and only in view. But there is apt to be a loss also of all the characteristic mental attributes of the male animal. In short the animal is too apt to become feminine in more than one sense, and to an extent that was not contemplated and that is not desirable. In the 'entire' horse there is a tendency to mental, nervous and muscular exaltation or excitement: the animal is apt to be impetuous, to give way to its passions, to develop vicious or dangerous habits. In other words, it is savage, vicious, excitable, irritable, destructive and violent, and hence troublesome or dangerous to manage. The object of castration is to moderate impetuosity, calm the passions, eradicate vice, tame and subdue the animal, thereby rendering it more docile and submissive to man's service or requirements.

Even when the operation is properly performed, it is not always successful in bringing about the desired improvement of character, while there is always a risk of deterioration instead of improvement. No doubt ardour or impetuosity may be diminished, but along therewith, there is only too apt to result a diminution of physical strength and moral courage, while there may be a general blunting of the animal's susceptibilities. When, on the other hand, the operation is imperfectly or improperly performed, the effects may be most untoward, including, for instance, the development of dangerous viciousness (Pierquin).

In the dog—according to Fleming—*castration* produces a change in its ordinary affections: disobedience, non-amenability to punishment, a desire for seclusion, refusal of food, irritability, moroseness, and biting; that is to say, the result is altogether bad. And this has to be noted in connection therewith, that these effects of a mere *surgical operation* have sometimes been ascribed to the popularly dreaded rabies. According to Pierquin, the operation in question in the dog is apt to induce melancholia or imbecility of mind, or both, while it begets unfitness for work by reason of developing

stupidity or lethargy. The result, however, is determined very much according to the animal's *age*. Puppies are made sulky and unhappy by the operation of rounding, says Walsh. Lord Southesk, however, referring to the sleigh dogs of the Indians of the Saskatchewan district of North America, mentions that 'many of the male dogs of this wolfish sort had been emasculated to tame their fierceness and spirit without spoiling them for their work;' a statement which would lead to the inference that the effects of castration in the dog are not always or altogether bad, as they are represented to be by Fleming, Pierquin, and Walsh.

By castration, too, the vicious, unmanageable bull is rendered docile and submissive; and viciousness being removed, all the dangers arising therefrom are equally so. The ram, also, whose sexual excitement is intense and dangerous from its aggressiveness, becomes inoffensive after castration (Fleming). White remarks on the similar results —in changing the natural propensities—from removal of the tusks of the boar, a fierce and venereous animal, which after castration loses altogether its sexual appetite.

The parallelism in character between the castrated horse and the human *eunuch* has been remarked upon by Maudsley. The stoppage of mental growth in the eunuch of the Turkish harem, the deterioration or degeneration in him of mental character require, therefore, only a passing reference here.

The *spaying* of female animals by veterinarians has as its object to render them docile; and the operation acts in a similar way to castration, by removing the organs on which erotic furor depends.

Other forms of *surgical mutilation* of organs produce even more immediate and marked mental results in other animals —to wit, excision of the antennæ in ants as practised experimentally by Latreille and Lubbock. Latreille says the animals operated on fall at once into a state of delirium or mania: 'Je vis aussitôt ces petits animaux que j'avois ainsi mutilés tomber dans un état d'ivresse, ou une espèce de folie. Ils erroient çà et là, et ne reconnoissoient plus leur chemin.' Lubbock says of one that 'had lost the terminal portion of both antennæ:' she seemed to have lost her wits; she

remained motionless and apathetic for a whole day, and was then found dead.

The influence of *sex* in the production of mental disturbance is perhaps best seen in the morbid mental phenomena of *maternity* and the conditions which precede, accompany, and succeed it, in the female—that is, of pregnancy, parturition, and the puerperal state. These conditions, which are both physiological and pathological, or, while always the one, are only too apt to pass into the other, render the *female* sex, as in man, peculiarly liable to mental disturbance, and in so doing they constitute sometimes a merely *predisposing*, at other times an immediate or *exciting*, cause.

Pregnancy shows its morbid influence in many acts of the lower animals, e.g. in the murderous propensity of the queen bee. In her, retardation of the process of egg-laying leads to mental derangement, and thereby to blunders and the introduction of domestic and political confusion (Figuier). Chillingham cattle are dangerous when calving (Aylmer). 'During the period of procreation the mother (whale) is much fiercer and more dangerous to approach than at other seasons, when it is a timid, harmless animal' (Brown). At the period of parturition or whelping in the bitch—according to Walsh—the animal becomes watchful and suspicious, and is apt to destroy its young for the most trivial reasons—such as the approach of strangers or the slightest interference with its litter. Buckland also has commented on the frequency, in various other animals, of *murder* of the young by the mother while in the puerperal state, and on the triviality of the exciting cause—the least disarrangement of, or interference with, the cage, nest, litter, mother, or young. And Jesse, too, refers to *parturition*, as well as absence of milk, as causes of *cannibalism*—of the female parent devouring her own offspring.

Female ruminants, while rearing their young, are full of fears or suspicions (Houzeau). The tyrant shrike becomes quarrelsome during *incubation*, and infuriated at the approach of intruders (Baird). And it is common for other incubating birds fiercely to attack even man in the neighbourhood of their nests. Here there is probably or apparently a morbid

fear and uncalled for ferocity; for in the majority of cases—for instance, my own, when I have been assailed in spring by fresh or sea-water birds on unwittingly nearing their nests or themselves—the supposed intruder or threatener of danger did not dream of the existence of a nest till his attention was thus called to it by the mistaken behaviour of the ruffled and angry mother, whose own best policy would obviously have been to have maintained a discreet silence in hiding beside her young.

The courage of various birds is developed or stimulated to fury during *nidification*, or boldness then arises in animals that are at other times timid, such as the tern (White). Similar mental phenomena are exhibited by certain animals during all the stages of incubation and care of the young. The furiosity of the hen during incubation is well known (White). When she becomes a mother she loses her usual placidity; and so intense is her excitement sometimes that she seems as if 'possessed,' and is popularly so described—her mental condition for the moment amounting apparently to an *ephemeral mania*.

Just as *dentition* in the young animal frequently produces the physical state known as 'fever,' so it is also apt to give rise to corresponding mental excitement. In the old, on the other hand, *toothache* and decayed (carious) teeth are probably no infrequent cause of mental, as well as of bodily, disturbance (Crisp).

The elephant occasionally becomes 'mad with toothache,' and is shot by man while in this state, in consequence of its dangerousness to human life. Thus an Indian official, who reported to his Government the death of such an animal in the Nilghery (Madras) district, in 1875, remarked: 'His tusk was much diseased, and he must have suffered much from toothache. The portion of tusk imbedded in the flesh was much diseased, and had a knob on it as big as one's fist;' in other words, it was possibly the seat of an *exostosis* or other morbid growth.

The effects of *moulting* are most familiar in the change of the singing ability of certain birds. A caged siskin, belonging to an old friend, droops equally in body and spirit,

becomes sometimes even blind, when moulting; while, in other birds, this physiological process produces enfeeblement of memory (Houzeau).

In so far as the *female* sex is exclusively liable to the derangements—both mental and physical—that accompany or characterise pregnancy, parturition, the puerperal state, and lactation, it may be inferred, and naturally, that the sex in question is necessarily more liable than the other to the various forms of *mental disorder*. But this by no means follows; for the male sex has its peculiar disadvantages, which may or may not counterbalance those of the female. As the bread-winner, forager, protector of mate and young, as the leader of flocks and herds, the male is much more exposed to a variety of dangers, and is much more liable to that which is more frequently a cause of mental disquiet and upset than mere physical danger—viz., to protracted anxieties, or worries. And it is just possible that these anxieties and risks, his peculiar duties, with the results they may involve, may counterbalance maternity and its antecedent or immediately succeeding conditions, in which case we should expect to find the sexes, on the whole, equally liable to the major and minor forms of insanity.

But in point of fact, the relative liability to insanity of the sexes among the lower animals is still an open question. At present we possess insufficient data for its determination, and the subject is one of those which offer themselves to the scientific and experienced veterinarian for full investigation.

CHAPTER XV.

PHYSICAL CAUSES OF MENTAL DIFFERENCE AND DISORDER.

II. Pathological.

THERE is no reason to doubt that *lowered vitality*—in all its degrees and however brought about—is as fertile and as inevitable a cause of mental disorder in other animals as in man. The causes, moreover, of general feebleness of health are the same in kind as those which operate in man, including, as they do,—

1. All sources of physical exhaustion or fatigue, such as that resulting from—
    - *a.* Excessive work.
    - *b.* Serious drain or discharge from the system of important fluids, such as the blood.
    - *c.* The injudicious, debilitating treatment of asthenic maladies.
    - *d.* Protracted weakening diseases.
2. Privation of food or drink, or the use of aliment that is innutritious.
3. Undue exposure to the weather.
4. Overcrowding amidst foul air.
5. Disordered or deficient relaxation, rest, or sleep.
6. Personal uncleanliness of skin and its appendages, arising from neglect of bathing, or from deficiency of water for ablution.
7. All kinds of artificial and unhealthy habits, especially those which involve defective work and exercise.

Some of these causes are more provocative than others of nervous irritability, and of ill-health of a nervous type—in which type of disordered health, morbid mental conditions are

most apt to be developed. Ill-health, produced by any one or more of the before-mentioned causes—and they generally operate in considerable combinations—is favourable to the production of insanity in other animals as in man, when the debilitated system is exposed to the same additional, powerfully exciting or depressing influences. *Ill-health*, in fact, constitutes a very common predisposition to, or predisposing cause of, mental disturbance in the lower animals.

Horses too long in harness are liable to nervous agitation, delirium, and the exhibition of mad-like actions (Houzeau); so that overwork in them, as in other animals trained to man's uses, is not only a mistake in policy, economy, and humanity, but it is directly dangerous to human life. Closely allied to the subject of overwork is meagre rest, want of *sleep*. The necessity for the periodical renewal of energy—mental as well as bodily—is quite as great among the lower animals as in man; and hence sleeplessness, especially if protracted, begets the same kind of psychical and physical results. Thus it is provocative of mental and bodily languor or listlessness. The Koraks, in the treatment of their teams of Esquimaux dogs, show an example to many more civilised peoples in their recognition of the need of ample rest and sleep for hard-working animals.

All kinds of bodily suffering or *pain* may produce a kind of waking temporary delirium, which is but a stage towards mania (Houzeau). We read of the rhinoceros, elephant, reindeer, and other large animals being 'maddened with pain,' be it of toothache or fracture, the bites or stings of insects, or the wounds inflicted by man. The expression, so frequently used in reference to our domestic or menagerie animals, of being 'mad with pain' probably describes a furiosity that is apt to pass into, if it be not sometimes a transient, *mania*.

All exhaustion of body which involves weakness of brain is accompanied by, or leads to, certain kinds of nervous and mental excitement.

The nature of the *diet*, of the food and drink, especially the former, has a very direct and marked influence on the mental character of the lower animals. Thus a stimulant

diet in the horse produces irritability, restiveness and viciousness (Pierquin). Long ago it was observed by De la Mettrie: 'Raw meat gives fierceness to animals, and would do the same to man. This is so true that the English, who eat their meat underdone, seem to partake of this fierceness, more or less, as shown in pride, hatred, and contempt of other nations.' There may be more truth in this remark of our French critic than we are willing to admit. At all events there can be no doubt of the more stimulant character of *animal* than of vegetable food.

'High feeding' of all kinds, in animals not accustomed to it, may beget a fatal pugnacity, e.g. in rams (Baker). In preparing the elephant for show-fights in India—such, for instance, as those which took place before the Prince of Wales at Baroda, in November, 1875—males are selected and 'kept for months previously on a diet in which butter and sugar are the principal ingredients, the effect of which is to bring them into a ferocity of temper which is known as Musth.'[1]

The result of the specialisation of food, and of a careful dietetic upbringing, is illustrated in the psychical character, as well as the bodily organisation, of the worker eggs, or larvæ, among hive bees, which are fed on royal jelly and treated as queen larvæ. They become in time perfect queens (Carpenter). The influence of food in its minor degree is more familiar, however, in the cat. According as its food is mainly or entirely vegetable or animal, its natural character and habits are intensified or modified. It becomes either more savage on the one hand, or more docile and gentle on the other.

Hunger leads to fretfulness of temper and anger in birds (Adams), to irritability in the dog. It is not, therefore, only the 'hungry man' that is 'angry.' Hunger leads also to combativeness and wars in bees (Réaumur). Starvation is only too common a mode or means of artificially producing the degree of ferocity required in the sports of tyrant man—for instance, in the case of so-called 'fighting' beetles.

[1] 'Scotsman,' November 22, 1875.

Hunger, by begetting quarrelsomeness and fighting, overcomes the results of discipline and the sense of obedience and fear sometimes in the 'happy families' of menageries.

On the other hand, harmony is unquestionably produced by, and indeed depends upon, good feeding. An abundant and suitable food-supply bears a striking relation to the important mental quality—contentment; and its influence in the production of vivacity, exhilaration, energy—mental as well as muscular and nervous—of courage, perseverance, willingness to work, is well known in the case of the horse, dog, fowl, and other domestic animals (Pierquin).

Excess in food is quite as deleterious and dangerous to both the mental and bodily condition of an animal as its deficiency or complete privation. The *physical* effects include death from mere surfeit, from gorging, gluttony, overfeeding or overeating to an inordinate extent.

Many birds that habitually overeat die from excess of fat in the system, from what is technically called *fatty degeneration*, while during life they suffer from an obesity that interferes materially with progression, or with flight from, or opposition to, an enemy (White).

Among its commoner results are semi-somnolence, stupor, and helplessness, inability to move or defend themselves, rendering the gorged animals easy of capture by man. Such results of overfeeding, especially the rendering an otherwise dangerous animal innocuous and manageable, are taken advantage of by man in many ways. Thus, when it became necessary to remove the boas in the menagerie of the Jardin des Plantes, Paris, from an old to a new house, it sufficed to overfeed them; they then became 'as easy to handle by the keepers as so many cables.' Morbid voracity, excessive greed in eating, produces a kind of stupidity, and thereby leads to facility of capture by man, in the albatross, vulture, siskin, and other birds.

Gorged animals also minister to man's amusements, sometimes of a very cruel kind. Thus we are told that 'a favourite amusement of the native children (of New Guinea) was to chase vultures when they had so stuffed themselves as to be unable to fly. And it was laughable to see the ungainly

attempts of the birds to escape by running. They frequently fell over, and then the children were almost sure to effect their capture before they could rise again' (Lawson).

Gorging with animal food in man induces a somnolence resembling that of the carnivora (Radcliffe).

Overeating is a common result or vice of confinement, excess of food, that is—and especially of highly stimulating food—in relation to the amount of exercise or work. Overfeeding is usually associated with improper feeding among our domestic pets—for instance, pet birds—to whom overindulgent and injudicious mistresses too frequently give raw meat, bread, sweets, and, in general, portions of all the foods, and perhaps drinks also, they themselves employ.

The result is not only the development of various forms of bodily disease, which frequently prove fatal, but of various marked changes of temper, irritability being very often, and pugnacity or ferocity occasionally, induced. The same kind of *injudicious feeding* is common on the part of thoughtless, careless visitors to menageries and zoological gardens; for instance, to the Zoological Gardens of London, whereby the lives of many valuable animals have been sacrificed. There is now, and most properly, in the latter gardens, a strict prohibition against visitors attempting to feed any of the animals. These are simple illustrations of man's minor sins of ignorance or thoughtlessness against the lower animals.

Berkeley describes certain kinds of food—such as putrid horse-flesh—as occasionally producing temporary insanity in his bloodhound Druid, 'if neglectfully or improperly given;' while Fleming points out that the eating of anthrax-tainted flesh gives rise to other symptoms of blood-poisoning.

Various kinds of *food* are *poisonous* to the lower animals, as to man, though it does not follow that the same substances are poisonous to all classes of animals. Thus certain fish and shell-fish (e.g. certain mussels) which, when eaten by man, or by certain men, give rise to the development of peculiar mental symptoms, probably produce the same result in certain other animals, though not necessarily so. For it has been abundantly established that some substances which are poisonous to man, and to various animals, are quite in-

nocuous to certain other animals.[1] Moreover, the same plant may be poisonous to the same species or individuals under certain circumstances, and innocuous under certain others.

This is well illustrated by the effects on cattle and sheep of the tutu or toot plant of New Zealand pastures, of which plant, in its young succulent state, both animals are very fond. Writing specially of the province of Otago in 1874, a colonist thus describes the varying effects of the *tutu*.[2] 'To cattle reared where it grows it is innocuous, and proves fattening fodder. But if a hungry bullock, unaccustomed to its use, should browse upon its tempting leaves, it will soon be seized with a species of *mania*, causing it to career and tumble about with violent paroxysms, till the poor brute falls exhausted and dies. . . . . Sheep do not seem to become so thoroughly accustomed to the use of it as cattle; and those feeding amongst it, on being dogged or driven, are apt to be affected by it, or be, as the phrase is, *tutued*. I have known of sheep feeding for weeks where the tutu grew thick and rank, on being moved a few hundred yards to a paddock where there were only a few straggling plants, being poisoned by them, and begin to drop down in dozens. Whether this was only owing to the excitement of driving, or to some difference in the plant in the two localities, I cannot tell. Sheep get over the effects more easily than cattle, but it leaves more lasting results. A sheep, which has been badly *tutued* and recovers, loses its gregarious habits and becomes what the shepherds call a hermit. It also acquires an additional amount of stupidity, but yields no worse mutton' (Bathgate).

Blood-poisoning of all kinds, as in man, is a common cause of mental disorder in other animals. And not only

[1] I pointed this out many years ago as the result of a series of investigations conducted in the City Cholera Hospital of Edinburgh on (1) the antagonisms of Drugs; (2) the antidotes of poisons; and (3) the non-influence of certain poisons on certain animals. *Vide* the 'Association Medical Journal' for June 9, 1854.

[2] *Coriaria ruscifolia* of botanists. As may be seen from the 'Bibliography,' I had many years previously—in 1862 and 1865—fully described the effects on mind and habits of this narcotico-irritant poison, both in man and in the lower animals.

blood-poisoning, but all disorders of the blood which affect either its—

a. Movement.
b. Distribution.
c. Quantity; or
d. Quality.

These conditions of the blood, again, are more or less affected by every form of bodily disease; while deteriorated or disordered blood-supply in its turn tells upon the brain and nervous system and their functions, including mentalisation, sensation, emotion, no less than motility. Haughton attributes the venomous and rancorous disposition of certain animals to imperfect oxidation of the blood; just as dyspepsia, by leading to defective assimilation and improper quality of blood, is in man an acknowledged cause of spleen and irritability. According to the author quoted, imperfect blood-oxidation gives rise, in other animals as in man, both to intellectual and moral defects.

Of the causes of gradual *blood-deterioration*, one of the commonest and most familiar in other animals, as in man, is *dyspepsia*, habitual indigestion. Lowness of spirits is a frequent accompaniment or sequel in the one case as in the other. All digestive disorders, every derangement of the important functions of assimilation and nutrition, all diseases of the stomach or intestines, may lead to what is usually spoken of technically as sympathetic or symptomatic insanity, just as they produce also various secondary bodily diseases, such as convulsions in young cattle. Cerebral congestion and all its causes—anæmia and plethora, ichoræmia and septicæmia—may, more or less directly, produce morbid mental phenomena in other animals as in man. Reproductive derangement is a common eccentric cause of sympathetic mental disturbance. Panphobia is sometimes the result of, or at least it is intimately connected with, organic lesions—mostly thoracic or abdominal. Thus it accompanies *heart* disease, as in man.

By some veterinarians rabies and distemper in the dog are regarded as blood diseases. Whether they are really so or not, in both disorders, and especially in rabies, there is a well-

marked group of morbid mental symptoms, and this group is so important in the case of rabies that the subject of the *insanity of rabies* in the dog, for its proper treatment, would require at least a chapter for itself. I have already specially treated of it elsewhere. The group of mental symptoms which accompanies rabies is usually considered distinctive and diagnostic. But this can scarcely be correct; because the disease itself is constantly being—even by veterinarians—mistaken for, or confounded with—

a. Various forms of insanity—especially mania.

b. Mere transient fury, passion, or despair.

c. The results of peripheral irritation—such as the presence of intestinal worms or mechanical impaction—the results, in other words, of the presence of foreign bodies in various organs.

Various *poisons*—animal, vegetable, or mineral—produce in the lower animals conjoint physical and mental symptoms—sometimes of the same kind as in man; sometimes diverse—the difference in their action or its results, where such difference exists, being generally, if not always, due to the very different structure and habits of the animal affected.

Just as in man, again, all *organic disease* of the *brain*—congenital or traumatic, want or loss of its substance, defective, arrested, or perverted brain-growth—are apt to be attended with, or to lead to, mental defect or disorder. Functional disorders of the brain or general nervous system are also accompanied by or produce the same kind of mental disturbance as in man. Thus *epilepsy*, which is not uncommon in the dog and other animals, is apt to beget, or to be associated with, the same forms of mental degeneration as in man. It has been noted as a frequent precursor of mania, dementia, and death in certain animals. *Apoplexy* is another brain disease attended with mental impairment. Brain *hydatids*, which cause the 'sturdy' of sheep and cattle, give rise to a special group of mental symptoms. Pierquin mentions brain hydatids and cerebral *ramollissement* as causes or concomitants of idiocy in animals. Mental symptoms similar to those of sturdy are produced by *inflammations* of the brain or its meninges (Delacour), by *metastasis* of erysi-

pelas, of psoriasis, or other skin eruptions, or of other inflammations; by insect bites, and as a sequel to castration (Pierquin).

In short, all *bodily disease* or disorder, acute or chronic, general or special, produces in other animals as in man aberration of feeling, which may or may not pass into, or amount to, insanity (Maudsley).

Among familiar examples of animal *poisons* that produce mental, along with physical, irritation may be specially mentioned *insect bites* or stings. Horses are 'maddened' by mosquitos (Brown). The reindeer is also described as 'almost beside itself . . . . its face and head streaming with blood,' from mosquito bites in the Kânin Peninsula of the Samoyede country (Rae). The effect of the tsetse fly in maddening wild and domestic animals in Central Africa has been graphically detailed by Livingstone. Cattle exhibit terror even at the distant sound of this dreaded pest (Figuier). In Abyssinia, according to Prince, the sound of the 'zimb' produces similar consternation, the animals refusing food, betaking themselves to wild flight, and death frequently ensuing from fatigue, fright, or hunger, separately or combined.

In our own country, according to Kirby and Spence, Pierquin and other writers, the gad, bot, and breeze-flies beget in the ox, horse, and sheep respectively agitation, anxiety, or distress, excitement, restlessness, alarm, eccentric motions or various freaks of conduct, the animals affected becoming dangerous from their unmanageability. The mere act of oviposition sometimes induces, besides physical irritation, a frenzy or temporary madness, an ephemeral mania. In the horse the nose-fly produces impatience, restlessness, and torment—conditions favourable to accidents to man; while the forest-fly sometimes renders it frantic (White).

Irritation in distant organs, by producing sympathetic cerebral irritation, is a common cause of mental disturbance. One of the most familiar forms of this so-called *eccentric* irritation is the presence of *worms* of various kinds in the intestines. Thus *œstridæ* and *filariæ* in the stomach are

causes equally of colic and mania in the horse (Girard and Pierquin).

The influence of *entozoa* as a source of cerebral disturbance, including insanity, has been pointed out in this country by Cobbold. The possible presence of intestinal parasitic worms, of nematode entozoa, as a cause of conjoint mental and physical disorder, is a subject deserving to be kept constantly in mind by veterinarians; for there can be no doubt that the effects of their presence are frequently mistaken for rabies or other supposed incurable forms of madness or distemper, and the lives of valuable animals—such as the horse, ox, and dog—are sacrificed to this professional error. According to our first, and indeed our only, British authority on the entozoic diseases of man and other animals, worms in the lower animals produce the following group of symptoms:—General cerebral disturbance; apparent bewilderment; uncertainty of movement; convulsive twitchings; deafness; dumbness; amaurosis; mental imbecility; mania; and paralysis—all of which symptoms may be dissipated, the seemingly serious disease cured, by the simple remedy of an aperient. On the other hand, however, worms in the dog may produce no symptoms at all, or symptoms that are as sudden in their incidence as fatal in their issue (Cobbold).

Other *foreign bodies* appear to act simply as *mechanical irritants*, as in the case of a dog at Macclesfield that 'was driven mad from a pin having pierced, and become fixed in, the stomach' (Berkeley).

A thoroughly competent writer (Walsh) describes *in-and-in breeding* in the dog as resulting, or liable to result, in the offspring, in—

1. General excitability.
2. Uselessness for work.
3. Delicacy of physical constitution.
4. Want of mental capacity, mental imbecility, or—
5. Complete idiocy.

Gillmore mentions, as the result of breeding from a nephew in a sporting dog, that 'the entire litter were *idiots*, or at least so deficient in brains, that out of eight which I

reared not one was worth his salt.' Besides which, the pups were subject to various bodily disorders for eighteen months, when they were destroyed as worthless. *Cross-breeding* from certain stock seems also to produce mental and physical degeneration in the offspring. Thus in camel breeding, if the male parent be an Arabian, and the female a Bactrian camel, the offspring, besides being weak in body, is 'vicious and intractable in temper' (Wood). The general testimony of veterinary and other writers tends to show that too close breeding is apt to beget in the offspring a morbid sensitiveness or nervousness, and the insane diathesis; that it unfavourably affects the constitution or temperament, producing degeneracy or disease, both mental and bodily, as in man.

On the whole, however, it appears to me that the question of *consanguinity* in the parents, as a cause of mental defect or disorder in the offspring, cannot be said to be definitely settled either as regards the lower animals or man. As concerns the latter, it has been shown conclusively that, while much mischief results in certain cases from consanguine marriage, in certain others none can be detected. Recently the whole question was carefully re-examined by Mr. George Darwin, of Cambridge, son of the most celebrated naturalist of our day. But he does not seem to have added to what was previously known. Among other animals the influence may be, and probably is, more pernicious in proportion as the practice is much more common than it is in man. But the exact degree of influence remains to be demonstrated. What is the nature of the evil result, both in man and other animals, we know when an evil result happens. But, just as in man, in all probability evil does not necessarily or always result.

CHAPTER XVI.

PHYSICAL CAUSES OF MENTAL DIFFERENCE AND DISORDER.

III. General.

Weather changes, atmospheric influences, produce in certain animals excitement, passing sometimes beyond the bounds of control; in others, depression of spirits, of the character, in a minor degree, of melancholia. The feeling of coming weather-change is expressed in some animals by agitation, inquietude, bellowing, or other voice-sounds; in monkeys by excitement, characterised by, or consisting of, laughing, dancing, and leaping, followed even by erotomania, according to Pierquin, who speaks also of climatic influences producing insanity in the dogs of Kamtschatka.

Of atmospheric influences solar *heat*, if prolonged or intense, undue exposure to hot weather, causes sensorial disturbance, delirium, general irritability sometimes amounting to a kind of frenzy, even to mania, in the horse (Pierquin). Heat of weather causes excitement, irritation, irritability, or rage in bees (Watson, Figuier, and Lubbock), and associated therewith a dangerous liability to sting. It is in a condition of irascibility so produced sometimes in wasps that they, like bees, are apt to sting human intermeddlers with their freedom. Mrs. Burton describes the heat of Syria as a cause of madness—meaning apparently thereby ordinary mania—in English pet dogs there; for she expressly states separately that 'mad dogs are here unknown'—no doubt meaning rabid ones. In the same country and under the same circumstances such dogs perish also of 'decline,' without madness. One, she says, 'withered away in a

sirocco;' while males were 'temporarily paralysed, and bred paralysed pups with sore eyes.'

The mental effects of insolation or *sunstroke* seem to be very much the same in other animals as in man. Thus the morbid mental phenomena in a female ape included, according to Pierquin, various marked changes in habit and character, such as—

1. Irritability, associated with a tendency to viciousness, a development of the biting propensity.
2. Timidity.
3. Indifference, as illustrated by negligence of its usual caresses, and by making no distinction between men and women.
4. Loss of gaiety or liveliness.
5. Sometimes a species of stupefaction.
6. The look becoming wandering, wild, unsettled, or the gaze fixed.
7. Cries.
8. Perversions of taste and digestion, including loss of appetite, or voracious and indiscriminate appetite.
9. General exalted cutaneous sensibility.
10. Loss of agility.
11. Nocturnal agitation.
12. Uncontrollable bodily movements of an irregular kind.
13. Orthopnœa.
14. Epileptiform convulsions.
15. Erotomania, followed by ordinary mania and dementia.—

The whole symptoms, mental, sensorial, and motor, succeeding each other with great rapidity.

The tendency of protracted or extreme *cold* is, in other animals as in man, to produce dulness of spirits, languor, inertia—even a kind of stupidity or lethargy—as in Greenland dogs. It has a perceptible effect in diminishing the natural ardour or vivacity. In some cases, however, excitement, rather than depression, would appear to be caused. Thus we are told that cold so affects the temper of the loris that their disposition passes from gentleness into fierceness (Jones).

It is more probably the *light* than the heat of the sun which, while sought for and enjoyed by the dog when affected by certain diseases (e.g., distemper), is avoided by it in certain others (e.g., rabies). Apparently both solar light and heat—perhaps especially the former—become instruments of intolerable pain to the hyper-sensitive rabid dog. By some authors, indeed, but on insufficient grounds, shunning light has been regarded a diagnostic indication of rabies.

On the other hand, brilliant artificial *light* exercises a fatal fascination on many animals; so much so that it is made a common basis of modes of capture by man. Brilliant light from candles, gas-jets, or lanterns is a well-known attraction to various insects, birds, and fish, to their own destruction. Many kinds of midges, flies, moths, and butterflies swarm around, and immolate themselves in, gas, lamp, or candle-lights, as I have myself seen on a large scale in New Zealand. So very familiar is this wholesale self-immolation that these poor animals are popularly regarded as emblems of human folly, of human infatuation, in the non-resistance of dangerous temptation. Butterflies commit this sort of *self-destruction* in myriads in the street fires of Florence. Lanterns placed under water are used for the capture of certain fish and crustacea (Houzeau). This, indeed, is the principle of a patent recently granted to the Marquis of Chabannes for catching fish. His apparatus consists essentially of a lighted lamp, sunk in the water, surrounded by mirrors, and connected with a trap of nets into which the fish are allured (Fennell).

The old practice of 'leistering' or spearing salmon by torch-light, at night, in Scotland, is another ruder modification of the same principle; as well as the practice still existing in Fiji and elsewhere of spearing other fish by torch-light (Boddam Whetham). The glare of artificial light or flame is also employed by man in the capture of certain birds. The attraction of lighted wood, or of light or flame of any kind, for the chough leads to accidents from unintentional or mischievous *incendiarism* (Baird). The woodcock in Louisiana is killed with poles at night when fascinated or stupified,

as the salmon is, by the glare of torches (Gillmore). Lighthouse keepers in the Irish Sea and German Ocean frequently find woodcocks dead or stunned from having dashed against the strong glass which surrounds the lamp or lantern. The glare which warns man only lures this and other migratory birds to their fate. Silver-eyes (birds) in the south of New Zealand kill themselves in great numbers by striking against the lighthouse on Dog Island, near the Bluff (Buller). Quails are caught after crossing the Black Sea or Mediterranean by the use of lanterns at night held near the ground. 'The weary birds, running towards the light, are easily caught with the hand' (Van Lennep). Deer seem sometimes to be attracted by railway locomotive lights at night. A sort of stupidity from amazement at the novel sight appears to be produced, followed by paralysis of action or motion, and hence the occasional occurrence of fatal accidents to the animal on railways in America and elsewhere.

In all the animals, and under all the circumstances above-mentioned, the *fascination* or infatuation which possesses the victim is obviously destructive of all power of self-control. A kind of suicidal fury, according to some authors, is produced by certain kinds or intensities of light, and the animals literally rush upon their death, sometimes in countless numbers (Smiles).

A similar infatuation or fascination to that which is produced by bright light or flame is sometimes also inspired by brilliant, sparkling, polished *metallic* surfaces or objects.

The privation of light—*darkness*, natural or artificial—is equally productive of mental disturbance, though not usually of so singular and inexplicable a kind. Certain horses have a great dread of darkness. In them it produces a nocturnal excitement that is at once allayed by the presence of a night light (Youatt)—a circumstance that has its counterpart in timid children, nervous women, and the fanciful insane. In such sensitive animals, just as in nervous women and children, *fear* is apt to beget *delusion*. It is in darkness that a morbid fear of moving, heard, but unseen objects frequently arises—a fear that utterly misrepresents to the imagination the character of the objects, and creates ideas of danger

where no real danger exists. On the other hand, nervousness, timidity, terror, may pave the way for mania instead of mere delusion.

It would appear to be darkness that accounts 'for the nervous state of terror in a wheatear (bird) at a passing cloud, which, when sailing in the atmosphere above him, induces the bird to seek shelter in the nearest hole' (Berkeley). In the same way *eclipses*—especially of the sun—produce fear in certain animals, causing them to seek shelter or safety, while some birds make the mistake of roosting, as if for the night, or they give forth their night song (Pierquin). Darkness and light, moreover, have an obvious relation to ferocity or courage, and their opposites, in certain animals —e.g., the lion.

Pierquin describes the effects of the variations in the *electrical* condition of the atmosphere on the cat. A surplus of electricity in the air, a state of high electrical tension, produces sometimes hilarity, gaiety, noisiness, amounting occasionally to a kind of joyous mania, a morbid exuberance of animal spirits, especially in *young* animals, which are characterised by greater nervous impressionability than their seniors. Stormy weather, therefore, leads to sportiveness and general exalted activity, mental and bodily. Thunder, however, terrifies many animals, as it does many timid children and women. But this may be less from the electrical condition of the atmosphere than from the sudden darkness and heavy rain, for certain animals have a great aversion to rain or wet, or from the sudden, unusual, and terrifying noise. In South American cattle coming thunder produces excitement, amounting sometimes to madness or possession, preceded by much sniffing and agitation ('Percy Anecdotes').

Certain *colours* produce a singular and rapid effect on some animals, in certain cases this effect taking the form of mere aversion or antipathy, but in others that of an excitement or irritation that may amount to dangerous fury or mania, or that may lead even to suicide. There is no one colour that is an irritant to all colour-sensitive animals. Instances are on record of mental excitement, more or less intense, arising from white and black, as well as red-coloured,

bodies. As instances of insurmountable antipathies to certain marked *colours* Pierquin cites the case of a horse and of some birds in regard to black. Baker remarks on the obnoxiousness of white or grey colours to the elephant and rhinoceros. Various examples of animals enraged or maddened by colours are given in the 'Percy Anecdotes.' Rodel describes some of the dislikes of certain animals to certain colours as amounting to a monomania. Fleas in Ceylon 'have a great fancy for settling upon anything white. Thus a person with white trousers will be blackened with them, while a man in darker colours will be comparatively free' (Baker). A Madagascar bishop bird, belonging to a lady friend of my own in Edinburgh, has a dread of white colours, becoming excited immediately on the sight thereof. White animals are especially liable to persecution by black individuals of the same species—as in the case of the Faröese and other ravens (Darwin); and there are other instances of animals persecuting each other in consequence apparently of exceptional peculiarities of colour.

The effects of *red*—especially of scarlet—colours are, however, usually supposed to be those which are at once most incontrovertible and most familiar. No simile is more common in reference to a subject or object calculated to annoy, than that of the alleged influence of the display of a red rag or flag upon a bull. But curiously enough, in all my reading and observation, in all my conversations with persons familiar with the habits of wild and domestic animals, I have met with nothing like proof that mere redness, as a colour, is offensive to the bull. I have frequently been told that there can be no doubt about its so being, because everybody believes it to be true, and what 'everybody believes must be true.' But I cannot accept mere popular belief on such a point, or on any point in the natural history of animal mind, as equivalent to the demonstration of the accuracy of what is alleged to be fact. If the fact is so familiar, ample proof direct from nature should be constantly forthcoming, and it is not.

I have specially read accounts of bull-fights in Spain in order to discover how far the artificially produced mental

excitement of the poor animal is attributable to the redness of the little flags used by the picadors, and I have utterly failed to satisfy myself that without the other and more powerful accessories, the goading with the picador's spears, the mental confusion produced by so novel a combination of distracting sights and sounds, the mere exhibition of anything red would have produced fury or have developed combativeness. Thus in the most recent account I have seen of one of these pitiable exhibitions of Spanish 'sport,' we are told that before the bull-victim 'rushes wildly' at the piece of scarlet cloth held on the end of a small stick by the matador, it is already 'infuriated' by the barbarous treatment to which it has been subjected.

So experienced a traveller as Gillmore asserts that scarlet, 'as everyone knows, has a most exciting influence upon many animals, horned cattle in particular,' and he gives a case of assault by a bull on an old woman habited in a red or scarlet cloak. But here again it is not clear that it was the *colour* that attracted the bull, in so far as we are told that 'at first the animal only slowly approached her. But the old woman, becoming terrified, bolted for the exit of the field, and in her efforts to gain it missed her footing and fell;' then the bull made up to and bruised her with his horns, 'at the same time dragging her cloak off her back.'

Rats are said to be terrified or scared by scarlet, and it would be a happy thing for many a vermin-haunted household were this the case, and were it really possible by so simple a device as the use of this, or any other colour, to scare away such unwelcome pests. But I have met with as little proof of the accuracy of such a statement as in the case of the bull. Rowan describes the effects of a red cloth on the loon of Canada, while a correspondent of 'Science Gossip' says of the cassowary, 'Scarlet cloth excites its ire.'

Red proves attractive or exciting sometimes simply by virtue of its being a bright colour, similar effects being produced, but not so readily, by blue and white. Gillmore mentions that tying a piece of scarlet cloth round the neck of a domestic turkey and turning it loose on the prairies brought all the wild ones in the neighbourhood about it to

attack it, thus affording sport to the hunter—the object of the experiment. But it was not necessarily the redness or the colour that produced the given result; for *curiosity* at the sight of anything new, the presence of a cat, or the waving of a handkerchief or any other unfamiliar object would probably have produced the same effect. This red-collared turkey, so successfully employed as a decoy, was simply an exceptional and remarkable sight, and as such attracted its unwary fellows. Again, a tame magpie that was 'excited' at the sight of red slippers had also a special aversion to blue, so that the sight of 'a dress in bright blue makes him scream loudly' ('Science Gossip'). In both cases the brightness or vividness of the colour appears to have been the cause of the excitement.

With so many emphatic positive statements, I am not prepared to assert that *scarlet* is not a mental excitant to certain animals. The analogy of man, and especially the recent experiments of Dr. Ponza, an Italian physician, and of the renowned Jesuit astronomer, Father Secchi, on the effects of colour on human lunatics, tend to an affirmative conclusion.[1] But what I desire to show is—

1. That at present we have no adequate data for determining the exact influence of colours in the lower animals; while—

2. The subject appears one eminently deserving of, and suitable for, experimental investigation; and

3. The fruits of such an inquiry may prove of much practical interest and utility in a variety of ways, for instance, in scaring certain animals from gardens, fields or houses.

Intimately connected with this subject is the influence of *novel*, unusual, unexpected or unfamiliar objects, especially in a state of *motion*, an influence that includes curiosity, wonder, surprise, amusement, confidence, indifference, awe, attention, alarm, fear and suspicion—all as we so constantly see it exhibited in the case of the dog or cat. The want of

[1] It is but proper, however, here to state that my own experiments on the use of coloured—at least red and blue—glass in the sleeping room windows of insane patients lead me to opposite, or negative, conclusions.

motion in objects, in which the opposite condition is usual and expected, may produce the same effects in certain timid animals, as the sudden unexpected appearance of moving unfamiliar bodies. In either case alarm or suspicion is apt to be produced. That it is simply the novelty of the position that disturbs the animal is shown by the fact that calm observation and examination of the dreaded object, whether in motion or at rest, sooner or later dissipates fear, and disarms suspicion, so that what was formerly avoided as a possible or probable source of danger may become a plaything to the kitten or pup, and after it has served its purpose, of being, by virtue of its novelty, the plaything of the moment, it is as apt to be cast aside as the toy of the capricious child, the adage holding equally good in both cases, that 'familiarity breeds contempt.'

Certain *sounds*—musical or other—produce deleterious mental results in some animals. The effects of certain notes, tones, tunes, times, of harmony or discord, on the dog, causing it to howl its distress or irritation, are familiar. Some dogs tremble at music as if terrified (Darwin). Similar excitement is produced sometimes in the elephant, taking in it the form even of erotic fury. Music is said to have been the means of playing off dangerous practical jokes on the menagerie animals of the Jardin des Plantes, and it is represented as an easy mode in such animals of artificially inducing mania (Pierquin). Clara Rossiter tells us of a pet rabbit, which, when a *harmonium* was played upon by a lady, 'flew frantically at the instrument and violently scratched the legs till she ceased from playing. If she went to the *piano* and played on that, bunny was as frantic with delight as he was before with anger. He would run round and round the stool on which she sat, for five or ten minutes without stopping, till he was compelled to do so from exhaustion, then fell down by her side panting for breath, otherwise quite motionless. After recovering himself to begin again, he rose to renew his circular race, continuing for an hour together, if my sister, in mercy to the poor animal, did not rise and go away from the piano.'

In mice, too, a delight, amounting to ecstasy, giving rise

to frantic action and ending even in death, has resulted from mere musical sound ('Percy Anecdotes').

Many *experiments*, some of them cruel in their nature, or in the extent to which they were carried, dangerous, moreover, in their results to human life, have been made to test the effect on different animals of different kinds of notes or sound. Thus Sir Everard Home found that bass created in the lion a dangerous fury or ferocity, that has sometimes been produced deliberately, inexcusably and maliciously also in other menagerie animals (Pierquin).

Music is, therefore, a frequent and powerful mental excitant or irritant in many animals. But it is also sometimes, on the other hand, a *depressant*, and the depression may be of such a character that were it continued by a persistence of the cause, it would be fatal occasionally in the dog (Pierquin). A minor degree of this influence is its *calmative* action, as when it is used in calming the rage of the rattlesnake or other serpents. 'There are most clearly proved instances in which enraged snakes' have been lulled to quiet and harmlessness by the music of the snake-charmers of India, so that they have allowed themselves to be played with, and afterwards have nestled peaceably for days in the charmer's turban (Miss Gordon-Cumming).

The owl is said to have an aversion to music (Mead). In other animals, mere antipathy is apt—if the obnoxious sounds are continued—to pass into fury. Further, music is equally productive, sometimes, of *morbid motor phenomena*, e.g. convulsions in a dog and cat, as cited by Mead.

Other sounds, not musical, have frequently a terrifying or disturbing effect, usually, probably, from the painful ideas or associations to which they give rise. Thus the growls or howls, or other sounds emitted by the larger and more powerful feral animals, such as the lion, create extreme alarm in those which are timid, smaller or less powerful—including especially the horse. The sound, like the sight, of hated or dreaded persons or things, acts similarly by the law of Association of Ideas. Thus the distant sound of the approach of the bot-fly terrifies cattle to unmanageableness, just as the mere sight of the breeze-fly produces

similar terror — general disturbance — in flocks of sheep (Figuier).

All *noises* that are discordant, loud, multiform, especially if they are in addition sudden, or sounds that are simply sudden, startling, loud, unaccustomed and unexpected, are apt to produce mental confusion or mental shock. And, moreover, physical, as well as mental, effects may be produced by sounds which give rise to mental shock, as in the case, mentioned by Sir David Brewster, of the dog that was killed by the noise of artillery. A similar case has been cited by Professor Adams. The animal, in the first case, was startled from its sleep; frightened by the unexpected sound, it exhibited, we are told, an agony of fear, marked by tremor, then hid itself and speedily died from the effect apparently of combined mental and physical *shock*.

The 'Animal World' tells us of a certain pet dog that was 'so nervous and sensitive as regards sudden noises that a clap of thunder, the report of a gun, or even a loud sneeze made her tremble for hours.' *Thunder* is an occasional cause of panic in menagerie animals, and stampedes occur in the wild quagga and gnu of Africa from unusual, supposed danger-betokening or dreaded sounds.

It is when, being stuck fast in a morass, the African elephant is confused by the yelping of dogs, that the hunter can venture to hamstring him (Livingstone). And it is amidst the distracting yells of men and boys in the crowded city streets that the poor footsore, overdriven ox first becomes bewildered, and then excited, perhaps to reckless, dangerous fury.

On the other hand, animals that are habituated to certain kinds of sounds, are apt to be startled or alarmed by their sudden stoppage. Silence—the utter *absence of sound*—when this is unusual and unexpected, may produce the same effects as discordant or terrifying noises. Thus the absence of an accustomed footfall, the sudden entry into a room or menagerie cage of a well-known and well-loved person, whose footfall has not been previously heard, is apt to startle, sometimes with a serious result (Bartlett).

Certain *smells* are sometimes the cause or subjects of marked antipathies on the part of certain animals, probably

by virtue of the association therewith of unpleasant ideas, of the memory of former wrongs. Several remarkable instances have been recorded in the columns of 'Nature' by Darwin, Huggins and others of singular antipathies of dogs to butchers and everything connected with slaughter-houses and fleshers' shops. In some of these cases it might well be supposed that smell had awakened unpleasant memories. But this could not have been the case in young animals with no experience of butchers and in whom the singular antipathy had been hereditarily transmitted.

Johnson ascribes the cause of the aversion in dogs to butchers to the odour of raw flesh and blood constantly adhering to their clothes and persons. But the same dislikes are manifested when the flesher presents himself in the unexpected garb of a fashionable gentleman, in new clothes free from all contamination with the smells of shop or slaughter-house, his own person being also thoroughly cleansed by bathing. That such changes in personal identity do not deceive the dog may be held to prove—I do not say that it does so—simply the keenness of its sense of smell. The smell of a butcher seems to give rise in certain dogs to a vivid desire for the revenge of former injuries, not necessarily or usually, however, received at the hands of the individual who is viciously attacked.

Goldsmith asserted that the smell of blood in the horse sometimes causes madness, and other authors have remarked upon the irritation, marked by kicking or other symptoms, in the same animal, arising from the same cause. Lewes speaks of 'convulsions of terror' from certain scents in the dog, while the 'Animal World' informs us of a bitch that showed 'frantic excitement' at the smell of kidneys, of which she was very fond. Macaulay mentions an elephant that, getting on the scent of a tiger in India, was at once seized with a fugitive panic. The smell of straw that has littered tigers and lions in menageries cannot be used for horses, in whom it inspires instant and dangerous terror (Laycock). The mere smell left by a dog has been said to produce excitement in cats, while the odour of the fat of the hyæna is represented as causing terror in the dog (Drake).

CHAPTER XVII.

MORAL CAUSES OF MENTAL DIFFERENCE AND DISORDER.

BELONGING chiefly to the so-called 'moral' or mental group of the causes of mental derangement in the lower animals are the following:—

I. All excess or exuberance of *emotion* or passion—including—
   - Mental *shock*.
   - Wounded feelings of all kinds.
   - Anxiety or worry of every sort and degree.
   - Anger in all its degrees.
   - Grief.
   - Fright and fear.
   - Love in all its forms.
   - Joy.
   - Envy, jealousy, rivalry and hatred.
   - Despair.

II. *Imitation* and *sympathy*.

III. *Novelty*: the unfamiliarity of objects, especially if suddenly presented.

IV. *Imagination*.

The influence of certain of the commoner passions or emotions in producing mental excitement or depression of a morbid kind is quite as obvious—when looked for—among other animals, as in man. The dog and certain other animals frequently exhibit in as marked *excess*, as in man, such feelings or passions as anger, grief or joy. Youatt speaks of 'excess or derangement of fondness' in the dog, while other authors refer to an 'overflow of love' on the

part of many other animals. So total sometimes is the absorption of interest and attention, in such animals as the cow, bitch, mare, pigeon, by the maternal passion, that the said passion has been described by Pierquin and Esquirol as amounting to a monomania of love.

Undue development of the maternal instinct, however, excessive motherly affection, sometimes proves dangerous or fatal to the young from the recklessness or stupidity of the mother's actions, or from morbid appetites or impulses arising in her.

Sexual love, again, may, and frequently does, become passionate in its intensity, and amounts to a well-marked eroticism, whether in other animals or in man. The dog is said to be 'warm-hearted' to a degree that in man, or rather in woman, would be called 'gushing' or effusive: there is in it an exuberance or extravagance of love or affection. The same animal is often said to be 'overjoyed,' to be 'mad with joy' or 'in an ectasy of delight' at the mere anticipation of some simple pleasure, such as a walk with its master. It is capable also of profundity of sorrow, and in many other ways it shows a capacity for excess of feeling.

Various writers speak of 'tumults' or 'raptures' of joy, fear, surprise, or satisfaction in the lower animals. We read of the 'fervency' or 'exuberance' of their emotions. Darwin speaks of the 'agony of passion' in birds. Now all such excess merely requires *duration* or *intensity*, or a combination of the two, to pass into a more or less permanent and serious *morbid* mental state. The vehemence or violence of the passions is frequently such that they get beyond control equally of will and judgment, and then become morbid and dangerous; for instance, jealousy in the monkey or dog; rage or fury in the tiger or jackal; sexual love in the stag (Pierquin). Passion conquers reason, permanently or for the time being.

But this is far from being a peculiarity of the lower animals (Pope); the same thing constantly occurs not only in children, idiots, insane persons, epileptics, and the deaf and dumb, but even among those of the most highly cultured of the most highly civilised nations, who pride them-

selves on the supremacy of their reason and the subjugation of their mere feelings. Passion, feeling, or emotion, then, of any kind, may become, in other animals as in man, not only immoderate, but uncontrollable, and its intensity may be such as to defy the power of expression otherwise than by paralysis of motion and of mind.

The habit of anger—constitutional irritability—frequently passes into mania, e.g. in the mandrill (Maudsley). It is apt to do so where it is continuous or intense, and where the cause of provocation remains for some length of time. A depressant effect may follow the excitant one in such a case: it may lead to dementia rather than to mania, or to the former through the latter.

We are told of a military elephant becoming 'frantic with rage and disappointment' at not being allowed to embark for foreign service with his regiment. 'No means could be found to assuage the grief or to calm the anger of this faithful creature, who so constantly mourned the loss of his friends.' In certain monkeys and some kinds of dogs, in the parrot also, anger is only too apt to become irrestrainable, to merge into a fury frightful in its intensity (Pierquin). It is as liable, in other animals as in man, moreover, to occurrence in *fits*, gusts, paroxysms, outbursts, or ebullitions. Their incidence is frequently sudden, their duration short or transient, their subsidence gradual and imperceptible, and their causation trivial.

It would appear to be a morbid combativeness or irritability that leads the hamster to attack with ferocity everything, animate or inanimate, with which it is for the moment angry. This ferocity is marked or accompanied by utter recklessness as to the size or nature of the offending or offensive object. The animal shows no dread even of fire or of red-hot bodies, turning fiercely on a bar of red-hot iron and clinging tenaciously to it till burned to death (Wood).

In the 'heat of passion' there is, in other animals as in man, an absence of reflection and of the power of self-control, action being determined solely by impulse. The result is that other animals, like man, are, in such circumstances, hurried into acts which they afterwards probably regret, and

for which they certainly have to suffer. Thus temporary irritation, loss of temper, anger in big dogs leads frequently to transient, blind, unreflecting impulse, and through it to crimes of which, as soon as committed, the animals become ashamed and remorseful, their usual magnanimity and forbearance having been overcome, just for the moment. It happens therefore and thus that *regret* and *remorse* are, in certain other animals as in certain men, the occasional sequelæ of unguarded passion or its criminal results. Such regret and remorse again—for injustice or crime—are not only possible, but probable occasional causes of melancholia and suicide.

Grief from the loss of companions, playfellows, mates, or young, masters or mistresses, of home, friends, and associations, is a common cause of melancholia, in which the suicidal propensity is apt to be developed.

The sense of *bereavement* in the bitch produces a whole series of varied mental phenomena, which include perversion of the sense of duty, and an abrupt stoppage of ordinary labours; implacable fury, succeeded by despair, gradually giving place to settled melancholia (Pierquin); apathy, loss or want of interest in, or desire for, life; and hence frequently suicidal impulse.

There are innumerable perfectly authentic instances of *deaths* from grief in various animals, death being usually preceded by self-starvation and marasmus. In the dog, mandarin duck, and other animals, such loss of friends and friendships leads to dejection or depression of spirits, followed or attended by refusal of comfort or consolation; in other words, the animal is really, as well as figuratively, 'inconsolable.' Jesse speaks of grief paralysing motion in the swallow.

Sorrow operates, and powerfully, even in the most unlikely animals. For instance, Houzeau records the case of a menagerie wolf that exhibited great grief at the withdrawal of its keeper, and that died, indeed, of grief after a third separation from the man to whom it had contracted an attachment.

On the other hand, 'delirious with *joy*' is an expression

as appropriate to, and represents a condition as common in the dog as in man. In that animal, indeed, the emotion is so intense sometimes as to be beyond the power of its expression (Houzeau). We frequently hear of its 'frantic state of joy' on the appearance of a long absent master or mistress. The pleasurable excitement of sport in the sporting dog, just as in the boy at his football, boating, or cricket, is apt to become excessive, and therein or thereby morbid, inducing, as sequelæ, conjoint mental and physical evils. Excessive joy would appear to have been the cause of sudden and intense mental excitement, amounting to ephemeral mania, in Berkeley's bloodhound Druid, 'after the death of a deer on the conclusion of a severe chase.' But to joy at success in such a case must be added, in estimating the causation of such mental excitement, the physical as well as the mental strain, the bodily fatigue as well as the triumph of victory.

In certain other animals there is occasionally a perfect 'wildness of joy,' great intensity of mental excitement from pleasurable emotions. Thus Darwin speaks of the 'madness of delight' in a stickleback (fish), meaning, no doubt, exuberance of joy, or uncontrollable animal spirits. Houzeau describes the joy of the Brahminy ox at the sight of fresh food after a sea voyage as extravagant; and the mongoose is represented as being in a 'frenzy of happiness at the death of an enemy. Gurney speaks of demonstrations of exuberant joy in the horse. What Pierquin describes as 'joyous mania' may be, and probably is, what medical authors mention as 'ecstasy'—a mere excess of delight, a pleasurable feeling, for the moment uncontrollable and inconveniently demonstrative, one of the major forms of joyous excitement.

The natural timidity or timorousness of certain animals has an intimate relation both to the facility with which *fear* may be generated, and to the probability of such fear, when generated, passing into suspiciousness and delusion. In some animals timidity is extreme; and in such cases they are usually otherwise eminently 'nervous' or sensitive. The nervous timidity in such cases, moreover, is usually congenital—has been transmitted from a line of ancestry, in

whom fear has been perhaps originally acquired and then accumulated or intensified. Their timorousness is shown by their liability to be easily startled, frightened, or panic-struck. These timid animals are generally defenceless, and the favourite prey of powerful enemies. They are only too apt to become the 'sport' of man, in more senses than one. Timorousness—frequently in this case, however, morbid or unnatural in its character—is a general characteristic of menagerie captives.

The West African elephant would appear to be morbidly timid. 'The very sight of a fence alarms it and renders it so nervous that, though it . . . . could break through with ease, it either resigns itself to its fate, or still further renders itself helpless in its frantic unsystematic attempts to get out of the enclosure' (Brown), a circumstance that is duly taken advantage of by the Fans in its capture.

Fear is at all times apt to become developed in connection with morbid *imagination* or fancy; and fear so developed is equally apt to be unreasonable and unreasoning, giving rise either to undue precautions for safety, or to precipitate flight with all its dangers. Hence it is that terror is always liable to arise from or at the sight of *unfamiliar*, strange, new objects, even in usually courageous animals, such as the dog and horse. Hence it is that what is simply unusual is gifted with an imaginary property of dangerousness. And hence, also, why fear is frequently exhibited by *young* animals, that grow out of it in proportion as the objects, which at first frighten them, become simply familiar.

A Newfoundland pup of Berkeley's 'was frightened at the sight of a live rabbit. . . . . The first rabbit he saw was in a trap; but no inducement that could offer would make him touch it.' Sheep are very easily scared or alarmed, as are the partridge, blackbird, and hare, by any unusual sounds or sights (Baird). Terror is readily inspired, moreover, in certain animals by colours, sights, sounds, or things, to which others are indifferent, pointing to the presence probably in the one case, and the absence in the other, of some latent *predisposition* or idiosyncrasy. And further, terror attaches itself sometimes in a singular way to special objects. Thus

a chimpanzee at the London Zoological Gardens was 'especially alarmed at the sight of a horse and cart;' while Darwin mentions the terror of a chimpanzee at the sight of a human coal-heaver.

The fear of threatened danger—even though unreal—of some punishment, merely pretended by man, obviously involves an excitable or fertile, if not morbid, imagination. In danger real or supposed—and in the supposed quite as much as in the real—the horse is apt to lose its ordinary trust in its rider, and is likely to seek safety—also real or supposed—in ignominious flight (Low). The same course of action is followed, under similar circumstances, by the dog.

But on the other hand fear, alarm, terror, horror, in their major degrees at least, frequently *paralyse* all power of self-protective action, creating a dangerous *immobility* of body, with an accompanying fixity of stare. This condition is often described as a kind of *fascination*, of which the main features are powerlessness of mind and body, with the gaze helplessly fixed on some dreaded object—generally some powerful enemy, such as a serpent. The spell-bound animal is otherwise said to 'lose its head' or 'wits' in some serious, sudden, unexpected emergency, in which presence of mind and readiness of action are all-important. To terror in the victim is due the power of the rattlesnake to 'charm' the said victim, to hold it as if spell-bound, fixed in its position and gaze, insusceptible of flight or motion. Pierquin gives the case of a cat in whom alarm at the sight of a dog produced a semi-stupor. Fear causes stupefaction in certain antelopes (Campbell). Such is the dread of armed men, or even of man's firearms, in certain baboons, that the mere sight of a gun, or of the act of aiming one—though the weapon be unloaded—begets sometimes paralysis of thought and action with its consequences.

In a minor degree, fear may beget *stupidity* or mental confusion, leading to injudicious or useless action; for instance, to attempted flight from enemies where escape is obviously impossible. Or bewilderment may produce a kind of self-destruction. Thus cockroaches, grasshoppers, and spiders, fleeing from, and pursued by, the foraging ant of

Nicaragua, 'in their confusion would bound right into the midst of the main body of ants' (Belt).

Fear is extremely liable to become *epidemic* in the form of panic, as is illustrated by the stampedes of horses, cattle, sheep, buffaloes, and other animals. And here once more we have a vivid or morbid imagination at work, either exaggerating actual danger, or creating ideas of danger where no real risk exists. In such cases the dread is suddenly developed—simultaneously perhaps—in a large number of individuals massed together; or it arises in one individual, and is rapidly communicated to others by *sympathy* and *imitation*. In different individuals of the same species, under even the same circumstances—and still more in different species and genera—the resultant phenomena include—

1. Equal paralysis of thought and action.
2. Utter indifference to, or forgetfulness of, consequences.
3. An absence of the usual precautions against danger; or
4. Loss of all power of co-operation with man in his efforts for their safety.

In addition to the conjunct operation of fear, sympathy, and imitation, we have in *panics* the influence, to a certain extent, of mental *shock*, of sudden *fright*, an influence which will be considered in a separate section of the present chapter. This fright is probably the original or exciting cause in the first animal affected. But the terror produced in it so rapidly communicates itself to other members of a flock or herd—to the number sometimes of hundreds of individuals—that it appears to bystanders as if the whole body of animals were simultaneously affected.[1]

Morbid fears, as well as dislikes, accompany various bodily *diseases* (Pierquin); and these unnatural fears always tend, where they are of long continuance, to pass into what in man are called *delusions of fear* or suspicion.

The influence of *fright* is so powerful and so well known, that veterinarians have proposed it as a mode of—artificially and experimentally—treating epilepsy in the sheep (Youatt).

[1] Compare what I have said on 'Mental Epidemics among the Lower Animals' in the *Journal of Mental Science* (1872).

Other animals are sometimes, like man, directly 'frightened out of their wits,' as in the case of a squirrel cited by Prof. Adams. Pierquin mentions a parrot whose intelligence was destroyed by fright; that is to say, the animal was thereby rendered mentally imbecile or insane. Fright sometimes leads the dog to be 'beside itself;' it becomes unable to eat, glares, growls, and pants in terror (Cobbe).

Fright, and all other kinds of mental shock, do not operate solely by virtue of the *suddenness* or unexpectedness of the sensory impression, or of the nature of this impression itself. There must generally pre-exist in the animal a certain *predisposition* or idiosyncrasy—a tendency to be readily startled or alarmed—with an imaginative liability to exaggerate, or to create ideas of, danger. In other words—as has been said also of fear—the animal, in whom fright is apt to produce the most serious effects, is usually one eminently nervous or timid. In such animals, and in proportion to their nervousness or timidity, sudden startling out of sleep or rest, for instance; unexpected peals of thunder or artillery; all kinds of unlooked-for sights and sounds—especially if suddenly presented or heard—are apt to produce striking results. And they do so in animals, sometimes, that cannot be placed in the category of those that are specially timorous. Thus fright is very common, from unfamiliar noises and objects, in menagerie animals in general, in which case, however, captivity has engendered a morbid timidity and fear.

The *results to man* of the frightening of animals with which he is intimately associated, are sometimes fatal, as in the case of a London coachman who was found killed by fracture of the skull in his own stable, and whose death formed the subject of an inquest at St. Mary's Hospital in January, 1875. Evidence went to render it probable that he had been kicked on the head by one of his own horses, which he had frightened by going into the stable by night in his night-dress and then suddenly striking a match.

Despair—the sense of hopelessness, of futility of effort—lends a spurious courage to the poor hunted animal 'at bay,' genders a ferocity that may amount to real mania, attended with imminent danger to the life of its foes, including that

of its arch-persecutor—man; or leads sometimes, on the other hand, to melancholia (Pierquin).

Rivalry—though it may be quite innocent, even playful—is as apt, as in man, to lead to excitement of a kind, or to a degree, that is uncontrollable and dangerous. It may lead variously to—

1. Crime—such as murder.
2. Mental disorder—such as mania; or to
3. All kinds of error dangerous to the animal itself, even to death, directly or indirectly.

Rivalry may be the fruit of mutual agreement for mutual pleasure; there may be invitation, perhaps playful defiance, to trials of strength, speed, or song, or to the display of personal attractions. But at all times it is liable to beget challenges in earnest, provocations or insults of a deliberate kind, and resultant fights of the bloodiest character. Thus the rivalry of male birds in courtship frequently leads to the sacrifice or butchery of all his competitors by one successful candidate for matrimonial favours. The rivalry of queen bees, too, results in fight and the destruction of all competitors by the strongest (Houzeau). Indeed, the mere dread of rivals in the queen bee impels her not only to fury or furiosity (Kirby and Spence), but to various acts of atrocity, including *murder* (Figuier). The rivalry of the race-horse may be nobler to begin with, but it is apt to degenerate, as is man's, and to give rise to unworthy thoughts, followed by ignoble deeds.

Rivalry almost inevitably begets *jealousy*; and it is this 'green-eyed monster' that is so apt to beget in its turn a murderous impulse, or murderous mania in the dog or cat. These animals sometimes assault or murder a rival—for instance, in the favour of a master or mistress, even though that rival should be one of their own offspring ('Animal World'). The 'maddening' influence of jealousy in male dogs is remarked upon by Fleming; and Miss Cobbe refers to the expression of jealousy by fury in the same animal. Jealousy in lap-dogs, when supplanted by rivals, frequently leads, on the one hand, to persecution of the successful newcomer, and on the other, to the refusal of food by the dis-

placed animal (Low). The latter may merely imagine itself displaced or supplanted in a master's affections; and hence its jealousy may be groundless. This, however, does not render the emotion less acute, less powerful or dangerous. The ostrich is liable to sudden *fits* of jealousy, begetting domestic quarrels—sometimes fatal—or serious mutilations of, or injury to, each other. And in other birds fierce, even murderous, attacks on each other are the occasional fruits of the same evil passion (Darwin).

An instructive instance of *jealousy* and its results in the cat has been given by Pierquin. In various respects there was first a marked change of character, including a gradual loss of affection for her young, whom she at first simply avoided. Then their approach caused anger, expressed by biting, followed by hatred. Next she killed one favourite kitten after another. She now became sad or melancholy, easily frightened, full of fears, solitary in her habits, refusing her usual caresses. And all, we are assured, apparently from jealousy at the growing attention bestowed by her mistress on her own kittens.

To appreciate such an incident or history, to be able to judge of the morbidity of feeling it illustrates, one must remember how ready the mother cat usually is to display her progeny; how she glories in her maternity, and glorifies her young, as the human mother adores her babe, obviously seeing beauties in them worthy, in her estimation, of general admiration; and how she takes every means of soliciting and securing it either by bringing her kittens under a mistress's notice in the drawing-room, or by leading her to admire them in their litter or lair.

Jealousy is a common feature of certain male animals at the rutting season, and it is this passion in great measure that provokes their fury in their combats for possession of the female.

Jealousy is important in its relation to the development of unjust or unfounded *suspiciousness* or suspicions, and the consequent punishment or revenge, as well as of *delusions* of suspicion or fear.

Both rivalry and jealousy, then, which are so frequently,

if they are not universally, associated with each other, often acquire the force of violent and uncontrollable passions, that pass into either murderous mania, monomania of suspicion, or suicidal melancholia (Pierquin).

In other animals, just as in man, there are no more powerful and frequent causes of mental disorder than *anxieties* or worries of all kinds, the result usually, in the cases equally of man and other animals, of the exigencies of the great struggle for life. These anxieties and this struggle are of course greatest in animals systematically persecuted by man, and least in those protected by him, though the latter are in their turn, as has been already seen, subject to disturbing influences of a different kind. Hence this class of factors of mental disquietude and upset is to be looked for in such animals as the poor hunted hare, the fox and wolf. The incessant cares connected with the necessity for the avoidance of man's multiform snares, or of more numerous and powerful predatory animals—the anxieties of war, of famine or destitution, of homelessness and exile, of a wandering, uncertain life, of man's cruelty in a thousand different forms—the excessive solicitude of the mother for her eggs or young, of the father for the safety of his mate and their offspring, of both parents, or of animals that have no maternal or paternal cares of their own—all tell on the animal mind as powerfully as parallel conditions do on man's.

As in the case of so many other causes of mental derangement, the influence of *anxiety* is determined probably not so much by its character or source as by its *duration*—its long or short continuance on the one hand, and its *intensity* on the other; which latter, again, will depend very much on the natural temperament of the animal, or on the presence of the co-operating influence of *predisposition*.

Vexations or *disappointments* of all kinds—in love or affection, in hope or desire—are scarcely separable in their influence from anxieties which, in truth, they directly produce. Wounded feelings—of pride, ambition, self-esteem, love of approbation, longing for attention; slights, affronts, neglect; the sense of ill-usage or injustice; the severance of attachments in bereavement; the rupture of old, cherished

associations, whether with persons, other animals, places, or things, are all not infrequent causes even of *suicide* on the one hand, and of *murder* on the other; while their minor effects are treated of in detail in the chapters on 'Sensitiveness,' and on the 'Bodily Results of Mental Causes.' So that what we call 'disappointments in love,' 'disappointed affections,' 'unrequited love,' 'hope deferred,' and 'blighted hopes,' are quite as frequent causes of mental depression and its sequelæ in other animals as in man.

Suggestion would also appear to be occasionally influential, in conjunction with *impulse*, in the sudden development of certain forms of insanity—for instance, of murderous mania. Among other animals, as in man, it is perhaps scarcely surprising

> How oft the sight of means to do ill deeds
> Makes ill deeds done!

The sight, usually unexpected, of an enemy—sometimes man himself—in a state of helplessness from unconsciousness, sleep, inebriety, illness, accident, or disease, generates on the moment the ideas of opportunity and revenge—ideas that are forthwith acted upon, too probably with fatal effect. Thus in captive feral animals—in the lions, tigers, leopards, and rhinoceroses of our menageries—the sight of a tyrannical keeper off his guard, or without his usual weapon, frequently suggests the dangerous impulsive spring or charge.

As has already been explained, mere *novelty*—of sight, sound, or position—is frequently sufficient to induce not only surprise or wonder, but alarm, terror, or mental shock, which, if protracted or intense, may lead by paralysis of thought or action to serious accidents to the animals themselves or to man. Thus it is probably the novelty of the position in lost city dogs that leads in them to a sort of mental paralysis, to a degree of bewilderment that renders them eminently nervous and suspicious. What is simply unexpected and unusual, what is new or novel, what is seen for the first time, is always apt in certain birds and in many other animals—especially those that are young, nervous, or unaccustomed to man—to produce a condition which, if there is action, is usually denominated *panic*, and if inaction, *stupidity*. Thus

the siskin betrays alarm if a master or mistress is seen with an unaccustomed dress.

The *suddenness* with which strange, because new, objects are presented to an animal, and the natural timorousness of the animal itself, have much to do with the nature of the result, with determining whether it shall be shock, terror, or surprise. From this sense of strangeness arises the very common dread or repugnance at the presence or approach of *strangers* exhibited by so many dogs or other animals—a phenomenon comparable to the suspicion, want of confidence, or dislike so often manifested by the child under similar circumstances.

Objects that are really perfectly familiar, and that attract no notice, or create no fear or other emotion under ordinary circumstances, may appear *unfamiliar* and invested with attributes of danger under unusual circumstances, including darkness or twilight. Thus Houzeau tells us of the effect of the sight of a fence on his own station on his own dog when the animal approached it in the twilight after a fatiguing day's work. Wild animals flee from their own companions when dimly seen in the twilight or dark. The springbok, oxen, and other animals in Africa show great inquietude, become timid and suspicious, in tall herbage, where they cannot see clearly before and around them. They manifest a decided preference for the open country, where they can watch the approach of enemies, and baffle them by speed or otherwise. The use of blinkers in the horse operates in a similar way, by preventing due vision on all sides, stimulating a vivid or morbid imagination, creating fear and suspicion, perhaps a series of fancied, startling or terrifying sights or sounds, amounting to sensorial or other delusions.

It is in this way that the *motion* of objects inspires a dread which the same bodies in their motionless state would not arouse; for instance, the very common, fitful, irregular, sudden, eccentric movements caused by gusts of wind in pieces of paper, straw, or other light substances. If these movements are seen in certain lights, or under any other exceptional or peculiar conditions, the alarm created may be altogether disproportionate to the cause, and it may lead to serious accidents to human life—e.g., from the horse.

CHAPTER XVIII.

MIXED CAUSES OF MENTAL DIFFERENCE AND DISORDER.

THERE are obviously certain causes of mental disturbance in the lower animals which are of a very *mixed* character, and cannot appropriately be classified under either 'physical' or 'moral.' Belonging to this mixed or composite category, possessing characters that are partly physical, partly moral, may be conveniently ranged—

I. Heredity and predisposition, including temperament, diathesis, and idiosyncrasy.

II. Artificial life; which involves—

- Captivity.
- Monotony.
- Inactivity.
- Solitude.
- Repression or non-gratification of the most imperious of the bodily instincts.

III. Privation, involving—

- Starvation.
- Homelessness.
- Exposure.

IV. Man's cruelty, neglect, or injudicious treatment.

It is impossible to exaggerate, either in man or other animals, in the etiology of insanity, the importance of that combination of conditions known as *predisposition*. These conditions may represent in a single individual a whole series of bad ancestral influences.

Heredity is as powerfully operative in other animals as in man; so that insanity and eccentricity; the nervous or insane neurosis, diathesis, psychosis or temperament; a con-

stitutional tendency or proclivity to mental derangement; morbid mental peculiarities of all kinds themselves, vices of temper, unnatural fears, a disposition to panic or panphobia, unaccountable dislikes, the mental consequences of ill-usage or hard work, and all manner of evil habits, are transmitted from parent to offspring. Thus we read of the hereditary transmission of the nervous temperament in the bitch (Walsh); of aversions or antipathies in the cat and dog; of various forms of vice in the horse, cow, bull, heifer; of strong impulse with feeble will; and of other indications of faulty mental organisation. As in man, mental unsoundness is to be regarded as the most certain of all the hereditary neuroses. Accidents of birth or ancestry, especially what is called *high blood* or breeding in such animals as race-horses or sporting dogs, in whom there is an accumulation in successive generations of the conditions summed up in the comprehensive term 'nervousness,' are, as in man, among the most fertile of the remote or predisposing causes of mental disorder. Among hereditary forms of mental defect or disorder, *idiocy* has to be included (McBride), and it is one of the forms that result too frequently, in an animal's ancestry, from man's ill-usage.

It would appear, then, that the study of an animal's antecedents, of its *family history*, of the mental condition of an ancestry is quite as necessary or desirable as in man in determining, or endeavouring to determine, the etiology of insanity, or the power for good or evil of ancestral influences. For a bias is given to the whole organisation, including the nervous and mental, by heredity.

Veterinarians speak of irritable, surly, and vicious *temperaments* or dispositions as specially conducive to the development of insanity in the lower animals (Fleming); while, as in man, we meet with the melancholic, phlegmatic, nervous, and sanguine temperaments, with all their combinations and modifications.

All forms of *artificial*, and especially of luxurious, life, by reason of the unnatural, unhealthy habits involved, are seriously damaging to mental soundness. Hence we find all forms of mental excitement and depression, all infirmities of

temper and defects of mental character, constitutional irritability, inertia—mental and physical, the most serious conjunct mental and bodily diseases—such as rabies—in menagerie and household pet animals. The unhealthy, unnatural conditions which conspire to the production in them of such results include—

1. Captivity—enforced confinement in various forms and degrees.
2. The repression or non-gratification of the natural instincts.
3. Defective air-change.
4. Deficient exercise—mental as well as bodily.
5. Overfeeding with unsuitable food.
6. Petting or pampering, over-indulgence, the non-correction of bad habits, encouragement of laziness.

Captivity—in zoological gardens, menageries, kennels, aviaries, cages, or aquaria—operates deleteriously on the mental character of the animals confined, not merely by the galling sense of the loss of freedom, but in a great variety of other ways, partly physical, partly mental. Artificial or compulsory confinement at once affects an animal's docility: it produces a morbid sensitiveness, both to mental and physical influences; it gives rise to various degrees of distress of mind, to irritability, irascibility, pugnacity, ferocity, or fury; it is apt to lead ultimately to nostalgia, melancholia, suicide, and even, in specially active animals, such as the ape, to idiocy, marasmus, and death. Excessive confinement in the dog produces fierceness and intractability (Lewes). The Aoudad sheep, which is described as naturally of very uncertain temper, becomes morose and suspicious in confinement. 'Sometimes he seems to be seized with an irresistible desire for assaulting something,' according to Wood, who has described other effects of captivity in various animals in his series of papers on the Zoological Gardens of London.

Captivity aggravates a natural tendency to pugnacity or irascibility in some animals, while it creates these qualities in certain others; so that a disposition to fight is frequently exhibited on trivial provocation, as in the ruff (Darwin).

In confinement the orang suffers from *ennui*, passing into melancholia, according to Pierquin, who describes *nostalgia* as one of the commonest results of captivity in other animals. The captive eagle is sullen and ferocious, while mischievousness is developed in the elephant and other animals (Watson).

Captivity involves want of mental, as well as of physical, exercise, perversion of many of the normal functions of free or healthy life, the non-gratification of the natural desires, abnormal conditions of temperature and light, and frequently monotony and solitude. Pierquin has dwelt on the influence of confinement in modifying animal character, artificialising and demoralising it.

But care must be taken not to overrate, as a factor either of bodily or mental disease, the importance of that element in captivity which consists of a sense of the mere deprivation of liberty, of the loss of personal *freedom*. For confinement is not in all cases enforced, involuntary, or punitive. Some animals are quite indifferent to confinement, to the deprivation of freedom (Adams). There are cases of others which have been liberated, or have escaped, and which, having presumably contrasted the benefits of domestication, for instance, with the disadvantages of the wild or free state, *voluntarily* return to a pleasant captivity.

It has yet to be determined how far *wild* and domesticated animals are, in proportion to their relative numbers, subject to insanity; and what in each class is the form, frequency, and causation of the insanity.

Miss Buist tells us that certain cage birds prefer *solitude* to society. We know that certain animals are naturally solitary or non-social, e.g. the common hyæna and the puff bird (Baird); and self-isolation, or aversion to society, is a common feature of *disease*—mental and bodily—in many animals. But, as a rule, the society of their fellows, or of man, is necessary to their mental comfort. There are some animals—more especially certain dogs—that care little, or not at all, for the companionship of their own species, but that have formed the strongest possible attachments to *man*. In such animals the want of the society of a loved master

or mistress, of a human favourite of any kind, produces the same kind of effects as the absence or loss of a mate or of young in other animals. The cat, horse, dog, and other animals show uneasiness in the absence of their usual companions (Watson); and some of them refuse to eat or work alone.

The *want of society* is specially felt in social or gregarious animals (Brodie), who are accustomed to be constantly surrounded by friends and companions; and it is in them that solitary confinement is most apt to lead—as it does frequently—to dementia or other forms of mental derangement, just as in man. Animals that lead a compulsorily recluse life, such as 'rogue' elephants and deposed chiefs among some other animals, are invariably in a morbid mental condition, of which the usually most prominent and dangerous feature is irascibility or ferocity.

According to Buckland, horses 'hate solitude, and are made savage by being kept alone.' *Love of company*, companionship, or society—sociability—is indeed strongly marked in the horse. Thus Pierquin gives a case of fury in a carriage horse when his companion was not in harness with him; their affection, when together, being shown by their mutual caresses. The effects of being kept by themselves, especially in strange quarters, include, in many cases, the restlessness and destructiveness of excitement; in others, the quiet of abject terror.

The results, temporary or permanent, on the mental character of other highly social animals, of *solitary confinement* has been pointed out by White and Stirling. Unhappiness —which is, however, the first stage towards melancholia, or other forms of serious mental disturbance—is, in the pigmy ape and other animals, one of the minor effects of being left without companionship.

Monotony, as a factor of mental derangement in the lower animals, is closely associated with, and usually inseparable from, solitude and captivity. Other animals dislike monotonous lives and occupations as much as man does; they suffer as much as he from want of novelty and variety; they have the same desire for amusement; there is equal necessity

in the case of many of them for relaxation on the one hand, and pleasant excitement on the other. Sameness has a similar depressing influence on them as on man, whether that sameness be of scene, surroundings, air, or food.

Young animals are as fond of *play*, and many mature ones of sports, as the human infant or child and the human sportsman are. And everything that interferes with this requisite and natural play, sport, excitement, *amusement*, novelty, or variety, is apt to pave the way for morbid mental conditions. Dogs go in common to the same places, at the same hours, undeterred by punishment, for their exercises and games, according to Houzeau, who describes also the recreations of the mother fox with her whelps, as including the playing at 'leap-frog,' or something analogous. Broderip speaks of the evening amusements of rooks. Various pastimes occur among other birds, and are not unknown among fish.

But many or most menagerie animals and drawing-room pets have no means of enjoying themselves in their own way with their own kind: there is no variation in their manner of life from day to day; and hence their morbidity, both of mind and body. Love of freshness or *change*—as of companionship, exercise, excitement, freedom, play—even in many cases of fun, is intuitive or innate; and it must be gratified if health—mental or bodily—is to be maintained.

Man's cruelty to, his neglect or injudicious treatment of, subject animals operates on their mental character deleteriously in a great variety of ways. He may be guilty of intentional, deliberate, wanton ill-usage in the form of physical punishment—for instance, by blows on the head; and these blows may be of such violence, in so sensitive an animal as the dog, that the most serious mental or bodily disorder directly results. Much more frequently his *neglect* is unintentional or accidental, the result of ignorance or thoughtlessness; yet it reacts mischievously on the natural or morbid sensitiveness of such animals as the highly-bred horse and dog. This species of neglect includes the inconsiderate subjecting of domestic animals to all classes of *preventible* causes of mental defect and disorder.

Occasionally in a literal, but more frequently in a figurative, sense man 'goads' animals into madness. On the other hand, his persecution often extends to the death of a poor animal in the hunt or race. He both literally and figuratively hunts or races them *to death*. I refer to cases in which death results from combined mental and physical exhaustion. Hunting by man—by bringing to bay, or producing desperation or despair—is, moreover, a fertile cause of the development of sudden furiosity, apt to pass into murderous or homicidal mania.

Man's *persecution*—for instance, of game or wild animals, of pariah dogs, of domestic cats, frequently leads directly or indirectly, through various degrees of wretchedness, to their *suicide*. Among the more immediate and minor results are incessant and increasing anxiety, and a constant sense of peril, apt to pass into morbid fear, and that into delusion. Teasing, tantalising, irritation, or provocation of all kinds—especially where persistent—is almost certain to give rise, unless in morbidly placid animals, in the first instance to loss of temper and to viciousness, with natural, but too frequently dangerous, efforts at self-defence or revenge.

Petting or *pampering* animals—such as the chimpanzee or dog—like children, has the same effect of 'spoiling' them as regards especially their moral character, temper, and disposition.

Punishment—especially if undeserved or excessive—inflicted by passionate, thoughtless masters, ignorant of their own best interests, is always apt to lead, in such animals as the horse and dog, to an outbreak of rage or fury, to sullen obstinacy, or to concealed feelings of keen resentment, which are gratified whenever a favourable opportunity for revenge presents itself.

Were man but to consider beforehand the possible effects on mind or body, or both, of animals useful to him, and on the integrity of which mind and body his own success in life perhaps depends, of his various forms of irritating, tormenting, neglecting, or ill-using them, he could not fail greatly to modify his present conduct and attitude toward them.

There are certain *combinations* of causes that are of much practical and public interest—inasmuch as their results are sources of daily danger to human life in all our large towns, while they are also *preventible*, though they are at present utterly misunderstood. I allude to the subject of so-called 'razed' or 'crazed' cattle, on their way through the streets of cities to the shambles. Fatal accidents from such animals are of constant occurrence, so that it is scarcely possible to take up a city newspaper without finding some case or cases of infuriated oxen—popularly called 'mad'—doing serious damage to man's life or property. I have had occasion to make a special inquiry into the mental and bodily condition of such animals, and into the causes of their suddenly developed dangerous fury, not only because, (1) I believe the subject to be one of the highest public importance; but also because (2) some serious accidents arising from this source have happened recently in my own neighbourhood—in one case almost at my own door.

On the Bridge of Perth, in 1874, a young lady, daughter of a well-known farmer in the Carse of Gowrie, was crushed to death by being butted against the parapet wall by a stot (a young bullock) which was being driven to the slaughter-house; and not long after, in Dundee, another stot and cow, that were also being driven from the Carse of Gowrie to the city slaughter-house, tossed people in the air, butted at them, knocked them down and rolled over them—happily in this latter case without fatal result. An inquiry into the circumstances of these local accidents brought out the following points relative to the condition of the cattle in question:—

1. Such cattle are usually *stall-fed*: they are kept all the winter in byres, deprived of exercise and air, and fed on provender—such as rapecake, calculated simply to fatten them for the market, not to produce either bodily or mental health.

2. Accustomed to a *monotonous*, secluded life among their own kind, incapable of much bodily fatigue from long *inactivity* of their muscles, tender of foot, intensely impressionable and nervous, they are suddenly driven many miles over

hard macadamised roads, which present the greatest possible contrast to the soft abundant litter of the byre.

3. They soon become footsore and *fatigued*, and drop down on the roadside from sheer exhaustion. If their drover is humane or judicious, he allows them frequent rests, and he drives them to and through towns at an early hour in the morning. But usually he commits the double error of losing his patience and temper, and of making no allowance for the disturbing influences—on such animals—of the *sounds and sights* of city streets.

4. The poor jaded animals are forced to their feet by repeated showers of *blows*, accompanied by all sorts of hootings and oaths. Exhausted and annoyed, they are driven at midday, or in the thick of the day's traffic, through the narrow, crowded streets of such a city as Glasgow, where they become *bewildered* by the novelty of the shops, the omnibuses, carriages, and carts, by the throngs of people, the incessant din, and the variety of *noise*.

5. Naturally the animals endeavour to escape from this confusion up bye-streets, or even frequently into shops. To the cries of the drovers and the yelpings of their dogs is added the *hue and cry* of the ignorant and excitable populace; the fugitive ox becomes to it a 'mad bull;' the aid of the police and even of the military is invoked: the animal is pursued not only with sticks and stones, but also with lassoes and fire-arms, with human *yells* of the most discordant and distracting kind; and then, in certain cases only, a—

6. *Fury* is suddenly developed, which may amount to mania—and is really of the nature of *ephemeral mania*—which fury is naturally wreaked on the first subject or object, living or dead, that presents itself.

7. That the mental *excitement* in the hunted animal is temporary is proved by two classes of facts, viz.:—

a. The results of the escape of such animals from their persecutors; and

b. The occasional judicious action of man.

The animal that caused the fatal accident (above mentioned) in Perth had comparatively easy access from the

bridge to the large, beautiful, riverine meadow called the North Inch—known to fame in Sir Walter Scott's 'Fair Maid of Perth:' to this open space it made its way, galloped to its further end, and there, espying a herd of cattle grazing quietly on the opposite side of the river (Tay), on the meadows of Scone Palace, and being then unharassed by its human enemies, whom it had out-distanced in the race, it swam or forded the Tay to its companions, was accepted by them without objection, and began to browse as quietly as if it had not been the hero of an 'accident' and the object of so much human excitement. On another occasion –also in Perth—which, however, is a quiet provincial town, whose streets are habitually nearly empty, an overdriven, excited ox was most judiciously directed into the courtyard of a church, where it was left fuming and fretting only till a few quiet cattle could be driven beside it. The result of the companionship was instant quietude, and that it could then be led or driven in the desired direction—probably the slaughter-house.

Now I find that farmers, or other breeders of cattle for the butcher, are familiar both with the peculiar mental condition of stall-fed cattle and with its causes. In certain cases they act practically, judiciously, and humanely on their knowledge or opinions: such as by slaughtering specially excitable cattle on the farm, being afraid of the risks to human life of driving or over-driving to market; or by sending them securely led by ropes, or at such hours as would secure transit during the greatest quiet and the least public traffic of the day, in country as well as in town.

But in other cases, regardless of anything save converting their cattle into cash, and complying with the printed letter of loose municipal or other regulations, their owners or drovers simply take the speediest and cheapest means of conveying them from their byre in the country to the shambles in the town.

It does not come within the scope of such a work as the present to indicate, to those whom it may most concern, how best to obviate the present evils arising from the driving of exhausted, excitable, or excited cattle, during the hours of

public traffic, through the most crowded streets of our large towns. But that these evils are *preventible*, and ought to be prevented, there can be no reasonable doubt. That fatal accidents occur occasionally is matter of much less surprise to those who reflect on their causes, than that they are not infinitely more numerous.

CHAPTER XIX.

MORBID BODILY CONDITIONS PRODUCED BY MENTAL CAUSES.

THROUGHOUT this work many illustrations are given of the influence of purely *mental* states, of feeling or emotion, in giving rise to *bodily* disturbance of every degree, culminating in death itself. But the physical conditions so resulting are of sufficient practical interest, and sufficiently numerous and varied, to demand special or separate consideration.

The most serious, and perhaps also the most common of these physical results of intense emotion, is *death*, either sudden or gradual. The former—*sudden* death—occurs in a very limited number of cases. There are occasional instances of literal *heart-break*, of syncope usually, but also of rupture of the heart-tissues or walls, under sudden and intense excitement or depression, passion or emotion, even when pleasurable: under joy, anger, surprise, fear or grief, for instance, in the dog (Pierquin). That intensity of joy which is known as transport or ecstasy may be fatal by syncope. A single paroxysm of rage may be fatal by the rapid and utter nervous exhaustion it produces. Dr. Adams gives an instance of fear causing instant death in a moose by heart-disease, what he calls 'paralysis of the heart,' but which was more probably mere syncope, in either case a sudden stoppage of the heart's action. He mentions also a squirrel, 'frightened out of its wits,' that died a captive, obviously also from sudden and intense fear, a phenomenon that is common among small birds captured by man.

Everybody who has had any experience of bird-pets must have met with instances of sudden death from fright in the canary or parrot, produced by the sight of a cat, or by its

unsuccessful jump at their cage. In such cases, the *suddenness of the shock* is as powerful in its physical influence as its intensity. And further, direct bodily may be combined with or substituted so far for mental shock, in the case, for instance, of a clumsy servant knocking over or down a cage with its timid occupant.

It is no part of my present duty or object to discuss the *modus operandi* whereby so striking a physical result as instantaneous death is sometimes produced by purely emotional causes. What I have to do is simply to point out the indisputable and direct connection between the mental or moral state and the bodily effect.

Emulation is sometimes carried to such excess even by an animal itself, at its own instance and for its own pleasure, for instance by the dog or horse in the race or chase, that death suddenly puts a veto on the sport: the overstrained animal drops down dead, even before it has reached its goal.

'A first-rate bird will sometimes sing till he drops down almost dead . . . . or quite dead, from rupturing a vessel in the lungs'—that is, from pulmonary hæmorrhage. This excessive *rivalry* in song, this singing literally to death, is confined to the males (Darwin).

We read also of animals fighting, racing, running to the death, of fatal effects from excessive persistence or perseverance in hunting, racing, coursing. In such cases there is not simply intense rivalry at work, not only inordinate pleasure in the sport or work, extreme eagerness to gain a coveted end; but there is also undue and dangerous physical strain on the nervous and circulatory systems, more especially on the heart. Death, therefore, may result from general exhaustion, or special (nervous) exhaustion, or from failure of the heart's action, preceded, or not, by serious palpitation.

Similar results, including sudden death, occur in animals hunted or persecuted to the death by man, in which case we have at work the additional potent emotion of fear.

The shock of fright is sometimes so sudden and severe as to cause instant death (Darwin).

Death, however, is much more frequently *indirect and*

gradual, being preceded by some, or all, of the following phenomena:—

1. Simple *loss of spirits*, marked perhaps by unsociability and unamiability, with a tendency to self-seclusion, taciturnity, moroseness and apathy, or other sudden change of habits, amounting to moping, sadness, listlessness or melancholia, familiarly spoken of as drooping; including the development sometimes of obvious *fretfulness*, so marked that the animal is said to fret itself to death. There may also be misery or unhappiness variously expressed.

2. Agitation, restlessness and want of sleep.

3. *Loss of appetite*, passing into obstinate refusal of food.

4. *Emaciation*, gradually progressing, from inanition by self-starvation, popularly described as pining, *decline*, dwining or wasting, and technically known as *marasmus*.

5. In exceptional cases some specific wasting disorder may be superadded, developed by debility and the predisposition it creates to inflammatory disorders from exposure. Of these specific disorders, by far the most common is *pulmonary consumption—phthisis pulmonalis*.

The physical evil may stop short, for a longer or shorter time, at any of the first four stages.

Death, lingering or rapid, as the case may be, results from the following *emotions*, mostly, though not altogether, of a *depressing* kind:—

1. *Grief*, or sorrow, usually inconsolable, mostly from bereavement of some kind, though the bereavement may be of an apparently trivial and temporary nature, the cause being in such cases quite disproportionate to the effect. Thus the same effect results in one animal from the simple absence for a time of some loved friend or companion—human or other—that in another arises from the permanent loss by death of a mate or of young, or of a human master or mistress, or which, in a third, is the product of removal from a home or place to which it is attached. In all these cases there is a severance or rupture, sometimes or generally sudden and unexpected, of attachments to persons or localities, of affections more or less tender or keen, of natural or artificial relationships, friendships or companionships between the most diverse

species and genera of animals, including man, with a sense of solitude and desertion.

2. Vexation or chagrin, however caused.

3. Other forms of *disappointment*, such as the sense of disgrace, humiliation, wrong, shame, dishonour or defeat.

4. Regret and *remorse*.

5. *Rivalry* and the *jealousy* therewith connected.

6. Homesickness or *nostalgia*.

7. *Joy* or surprise, frequently acting in combination.

8. *Sympathy* with human misfortune or suffering.

9. *Fear* or fright, sometimes causeless.

Simple *fear* in the dog of a master's anger has proved fatal, by causing it unnaturally to retain its excretions, the poor animal having probably been severely punished for soiling carpets, and having no proper opportunity of defæcating (Walsh). Here again is a suggestive illustration of the dire results to man's animal pets, of man's thoughtlessness; for in such a case there was probably nothing approaching intentional cruelty on the master's part.

10. Death has even been ascribed to *despair* at the impossibility of taking the benefit of an 'embarras des richesses' of prey (Eassie).

These emotions or mental states are influential in proportion as they are *intense* on the one hand, and *protracted* on the other; in relation, that is, to their quality and duration, while *suddenness* and unexpectedness of incidence are not less—are probably even more—powerful attributes.

In certain cases there is a conjunction of physical with mental or moral causes, for instance in the common case of unrequited or disappointed sexual love, in which mere gratification of an imperious physical appetite is involved; or in that equally common one of captivity, in which the gratification of the healthy love of freedom in the form of physical exercise is interfered with.

Death, gradual or sudden, direct or indirect, from emotion more or less intense, occurs in a great variety of animals, and in various stages of their growth, in youth and age, and in both sexes, particularly perhaps the female; including the following:—

1. Among the quadrumana: the chimpanzee, the ouistiti and other monkeys.

2. Among quadrupeds: various breeds of the dog, the horse, elephant, cat, pig, deer, wolf, mouse, sheep, cow.

3. Among other mammals: the seal and dolphin.

4. Among fish: the devil fish; and

5. Among birds: the common fowl (cock and chicken), turkey, pheasant, blackbird, linnet, piping bullfinch, canary, various larks, parrots and parroquets.

Some of these animals, it may be noted, are most unlikely subjects for intense emotion, especially of the softer kinds—for instance, the wolf, devil fish, pig and dolphin, and yet our chapter on animal 'Reputation' shows how much the real character of the animal is belied and misunderstood.

Of the various forms in which death occurs among the lower animals, as the result of certain mental conditions, —intense or protracted—none is of greater interest, none more human-like in its character, than what is commonly described as *broken heart* or heart-break. It is obviously very common among a great variety of animals and under a great variety of circumstances. Thus we are told that sporting dogs become 'heart-broken' by cruel treatment (Walsh).

The dog frequently dies of broken heart from the loss of its whelps by drowning or otherwise, or on the death of its master; but it does so also, and suddenly, from the shock of joy and surprise acting conjointly, as in the case of a pet dog whose master returned unexpectedly to it while it was asleep. When it awoke and found him in his usual position in his own arm chair, it 'gave one long look, sprang into his lap and died' ('Animal World'). The bullfinch dies also of broken heart at separation from its master or mistress, as was long ago recorded by Buffon.

When the bird-catcher takes a nightingale from its mate, it rarely survives—dying speedily of broken heart (Houzeau); and the same has happened with the linnet and many other cage birds. Even in the pig, death is recorded from broken heart as resulting from the loss of a mate or companion (Watson). A piping bullfinch that only fancied he had lost

the love of his mistress, a male chocollito (a South American parrot), distressed by the conjugal infidelity of his mate, a pet bull dog from jealousy of a rival, all died of heart-break (Wood).

'Found dead' is very common in the lower animals, for instance in pet birds, and many of these cases of sudden death—unexpected by man—are no doubt the result greatly of emotional causes. But, as in man, there are also many *physical* causes of sudden death among the lower animals, and we must not therefore set down all cases of animals 'found dead' to heart-break or other emotional disorders.

The popular belief in the connection between cardiac conditions and emotional states is variously illustrated as regards the lower animals. We speak, figuratively of course, but quite legitimately, of soreness or sickness of heart in such animals as the dog, horse and elephant. A lost dog is properly said to be heart-sore from the severance of the ties of affection, while if it be at all sensitive, it is 'disheartened' by rebuffs of all kinds. And, on the other hand, while emotion produces cardiac disturbance, the converse holds equally good—that cardiac disturbance produces abnormal emotional states. Thus Pierquin has pointed out the relation between cardiac derangement or heart-lesions and the development of morbid *fear* of every degree up to panphobia.

Cardiac disorders would therefore appear to be both causes and effects of mental excitement and depression. The relations of cardiac to mental derangement in the lower animals are not, however, at present well known, and I venture to suggest them, as an admirable subject for experimental investigation equally to, and by, physicians and veterinarians.

We have already seen, moreover, that the expression, 'broken heart,' is not always or necessarily *figurative*, whether in the lower animals or man, in so far as various *organic* lesions of the heart, including rupture of its walls, occur occasionally as the result of intense passion or emotion.

Further, various *functional* disorders of the heart's action, connected no doubt in many cases with organic changes in its structure, are not uncommon, as the fruit of emotional

excitement or depression in certain animals. These functional derangements include especially—

1. *Palpitation*, inordinate heart-beating, the condition or sensation known as 'fluttering' at or of the heart; and

2. *Fainting*, to various degrees short of death, technically known as 'syncope.'

3. Derangements of the *pulse*, without either palpitation or fainting.

4. Congestion of various parts of the body, active *hyperæmia*, sudden reddening to a marked degree, of the eyes for instance. Or on the other hand equally distinct—

5. Pallor from *anæmia*, removal of blood from any given visible part of the body.

Some of these conditions involve the general circulation as well as its central organ, the nerves as well as the blood-vessels and heart, the latter indeed necessarily through the nervous system. Hence it is that so many of them occur in other animals, as in man, in proportion as they are nervous, sensitive, highly-bred, delicately organised, luxuriously brought up. Nor must we forget that the condition known as—

Nervousness—a highly excited or excitable condition of the whole nervous system—is begotten by emotional shock, a condition that in its turn begets a tendency to alarm or fear, a facility of being readily startled.

Palpitation—fluttering of the heart—from fear, must be familiar to all captors of small birds. In the case of captured animals, and however captured, manifest heart throbs, or throbbing, are frequently visible or audible, because violent palpitation results or may result, partly from over-exertion of a physical kind, in ineffectual efforts at escape or extrication. Heart-fluttering is probably as common an indication of emotion in certain birds as it is in certain nervous or hysterical women, girls or children. A very minute degree of fear or surprise, or mental shock of any kind, puts bird and woman 'all in a flutter'—a condition of cardiac palpitation of a nervous and temporary kind, its degree being usually disproportionate in such supersensitive individuals to the cause of the mental excitement. Panting is also

probably a cardiac effect of fear in the first instance in many cases, gradually or suddenly involving the lungs. Panting, as well as inability to eat, occurs in the dog from fright (Cobbe).

Veritable *fainting*, or syncope, occurs occasionally under fear or from the shock of surprise or joy, just as in man, in the same sort of individuals and under the same kinds of circumstances. Thus we are told of a parroquet fainting on again seeing a loved mistress after an absence (Davies); but in this case the weakness of abstinence from food coexisted with the shock of joy. Miss Cobbe speaks of regular swooning or fainting fits in the dog as the effect of mental shock. Darwin describes monkeys, as well as canaries and robins, as fainting under fear or terror, and fainting is common in timid nervous animals captured by man, such as squirrels and small birds.

Low remarks on the effect of harsh language on the *pulse* of the horse. The effect of emotion on the condition of the pulse in this and other animals is a legitimate and interesting subject for man's observation and experiment, for at present we have almost no information on the subject, and the acquisition of information of a trustworthy and useful kind is obviously easy.

Hyperæmia and anæmia are virtually synonymous with the marked *colour changes* in the skin or various of its appendages, which form so common an expression of emotion in many animals. *Hyperæmia* is synonymous with determination of blood and its result—reddening or flushing—of this or that conspicuous part of the body. Congestion of the eye, leading to fieriness or fierceness of expression, is a common result of anger or annoyance in many animals, in whom the glaring, staring, blood-flushed eyeballs warn man, or other animals, or its prey, of an animal's temper. Darwin states that certain monkeys redden under the influence of passion, while they become pale or pallid under fear.

Pallor, *anæmia* or blanching of the face from fear may be seen especially in certain barefaced monkeys (Sutton), while exciting emotions, such as passion, produce in them reddening, flushing, suffusion—indeed all the degrees of hyperæmia.

Lee asserts that even the embryo *in ovo* of the *octopus* becomes flushed with anger at disturbance, a statement that would scarcely be accepted without ample confirmation from a less known naturalist. And he adds, that the same thing happens to the adult *octopus* under provocation.

Colour-changes under excitement—from passion or anger, provocation or irritation, for instance—or as produced by such various emotions as surprise, fear, or sexual love—changes of the hues of the skin or its appendages, are of a varied kind. They have been chiefly studied, and are best known in the chameleon (Darwin). But they have also been observed in the mandrill, the stickleback (Houzeau), the bis-cobra (Darwin), the sporting fish of Japan, and certain other animals. In the sporting fish in captivity in the Jardin d'Acclimatation, Paris, hatred, developed at or by the sight of another individual, causes its naturally grey colour to change to black, while the tail and fin become phosphorescent, and the eyes gleam furiously. These fish fight for man's sport, 'until one of them returns to its original grey colour, which shows that he has had enough of it.' In many birds the excitement of sexual love causes change of colour in various appendages of the head and throat (Darwin). Other instances of colour-change under emotion, as well as of many other physical modes of expressing mental states, are given or described in the chapters on Animal Language.

In interpreting the causes of such colour-changes, however, we must bear in mind that they are produced also by influences that are not purely mental, or that are not mental at all—a circumstance that is well illustrated in the case of the chameleon. 'Brücke and others have shown that in the chameleon the changes of tint may be produced by . . . . the excitements of anger and sexual passion, by illness and by local irritants and nerve-stimulation' (Francis Darwin).

A whole most interesting series of *motor* disorders, having their seat immediately in the muscular apparatus, but produced through the influence of the nervous system, springs from emotional causes. These disorders range in their

degree from fatal *epilepsy* or convulsions to mere scarcely perceptible muscular tremor or quivering, and they include paralysis or loss of motive power.

Epilepsy occurs both directly and indirectly from fright: directly in the parrot, where fright is habitual from the practice of throwing things at its cage to prevent its screaming (Buist); indirectly in the dog pup, from milk poisoned by rage in the mother. In certain cases, where the affection itself, or the tendency thereto, was not produced by mental causes, the fits are, nevertheless, determined by mental excitement—as in a fatal traumatic case in a dog, in which the disease was produced by a blow on the head (Wood). Blaine mentions among its causes in the dog—for it results from many causes, bodily or mixed, as well as mental—passion or anger, fear and irritability. The latter, however, is quite as likely to be an effect as a cause, considering the frequency with which epilepsy, however arising, produces mental disturbance or temper-change of various degrees.

Convulsions, non-epileptic in their character, are sometimes quite as serious as epilepsy itself; while there is every probability that simple and epileptic convulsions are commonly confounded with, and mistaken for, each other. Nor is the error of much practical importance, because the causes, results, and treatment are, or ought to be, the same. Buffon mentions an instance of convulsions in a bullfinch from fear and an unpleasant association of ideas at the mere sight of some beggars. Blaine speaks of convulsions in the dog from joy, on the one hand, and from the angry words of a master on the other. Convulsions have been caused, too, in the dog by mere reproof from a master ('Animal World'). Bosquillon gives a case of convulsions in a dog placed on a lion's skin; but though morbid or vivid imagination, giving rise to fear, was here probably involved, there may have coexisted physical as well as mental causes—for instance, strong olfactory impressions. Convulsive startings occur in the dog and other animals, both during sleep and in the waking state, probably connected, in certain cases at least, with morbid imagination.

A minor form or milder degree of motor—muscular and

nervous—disturbance is to be found in *tremor* or trembling, either general—of the whole body—or only of special portions thereof, as of the lips or teeth. Tremor varies in its intensity and duration, the mildest form and degree consisting of the mere transient nostril or lip-quiver in the high-bred, restless horse, or the teeth-chattering of apes and monkeys. Alarm, fear, or fright produces general tremor, trembling, or quivering in the young turkey and in various small cage birds. The bot-fly in cattle begets a terror that is expressed by general tremor (Figuier). Tremor is the result of restrained ardour in the harrier that is prevented by the leash from following the hare (Pierquin). Tremor of the leashed deer-hound in presence or sight of a deer arises probably from a combination of feelings or emotions, ardour or eagerness, impatience, expectation, and general mental excitement. Tremor in its various degrees is producible by different mental causes, of which the principal are—

1. *Fear*, fright, or terror in all its degrees.

2. *Excitement*, ardour, eagerness, impetuosity, impatience, longing, expectation—also of all degrees.

3. *Happiness*, physical and mental sense of enjoyment.

4. Mental *suffering* of all kinds.

Here again, as in so many other instances, the same or similar results are producible by purely *physical* causes, or by influences conjointly and variously bodily and mental; and it is frequently difficult or impossible to distinguish the psychical from the physical causes, or the degree in which the one or the other kind of influence has been operative in a given result.

The liability to tremor or general tremulousness or shaking of limbs is commonly spoken of as shaken nerves; and no doubt there is for the moment, and it may be more permanently, a generally disordered nervous sensibility. Tremulousness, indeed, is apt to occur in proportion to the nervous sensitiveness of animals, and hence it is commonest in high-bred dogs or horses endowed with extreme muscular and nervous irritability.

The most familiar instances of tremor from fear occur in the horse—for instance, in presence of the lion or of any

other much dreaded enemy; sometimes even in presence of objects really harmless and inanimate, but which a morbid imagination leads it to regard as dangerous and living, as has been shown in the chapter on 'Delusions.' Instances of emotional tremor in the camel, dog, kid and other animals have been given in the 'Percy Anecdotes' by Gall, Bonar, and other writers. In the race-horse tremor is the result of the excitement of emulation; in the mule and ass it is the fruit frequently of a sense of imminent and serious danger ('Percy Anecdotes'). In the high-bred horse, too, there is the mere quiver of the mobile lips or nostrils in impatience, or under other forms of emotion, and that of the lower jaw, from the excitement of sport, in the pointer (Baker). These apparently insignificant lip, jaw, or nostril movements are frequently a very delicate sign of mental agitation or emotion in the horse; and to a less extent in the dog, simply perhaps because in it the nostril and lip are much smaller and less mobile. In the lamb there is the general thrill of happiness, and in the cat, of content or satisfaction.

There may, however, be a *coincidence of mental and motor* phenomena, arising from a common cause; they may not stand to each other in the relation of cause and effect. Thus Pierquin notices the concomitance of sudden terror and tremor in an ape affected with the insanity of sunstroke.

There are certain other kinds of violent or disordered movement that result from emotional causes, and that are not included in the categories of epileptic or other convulsions, or of the various forms of tremor. They include various eccentricities of motion, such as gyration, staggering, and rocking movements of body or head.

Much better marked, however, and more common, is *immobility*—motionlessness, incapacity, or inability to move—paralysis of motile power or of action—a familiar result of fear in the horse and other animals. It occurs, for instance, in darkness in the horse (Pierquin); in which case a morbid or vivid fancy has doubtless much to do with the generation of fear. This common effect of terror of all kinds frequently leads to non-resistance to an enemy, to easy capture by man. Thus a dog was so terrified—on shipboard—

at the sight of the islanders of Rapa, that all power of self-defence, of escape, was paralysed, so that it tamely submitted to be captured by them (Houzeau).

What may be called a *paralysis of fear*—that is, caused by fear, and involving thought as well as will, apparently all the bodily and mental functions, for the time being—is familiarly exemplified in all animals overtaken by unusual and generally misunderstood, and therefore exaggerated, danger—such as fire, railway trains, or steamboats. Thus we are told that various animals were so paralysed with fear at the approach of a mass of burning lava during an eruption of Mauna Loa in the Sandwich Islands, after a terrible series of earthquakes in 1868, that they made no attempt at escape (Boddam Whetham). Rooks, pheasants, partridges, and other birds dash themselves against railway trains, or into the carriages, through the windows, open or shut, or they are knocked down by railway locomotives (Jesse). Sheep, cattle, buffaloes, deer, hares, and many other animals that might easily escape an approaching train by the slightest divergence at right angles to it or the line, perish in large numbers by their *stupidity* in standing still or in scampering in front of the engine until overtaken by it—their stupidity being the obvious result of their sudden and intense surprise and alarm. They lose all their usual power of self-preservation, making no attempt whatever to escape the on-coming danger.

The phenomena of what is called *fascination*—for instance, by snakes or other animals—of their prey also include familiar examples of paralysis of effort or energy, both bodily and mental, causing the poor victim, as if patiently and resignedly, to await its doom.

No doubt sudden fear is the real cause sometimes of otherwise unaccountable, sudden immobility in riding or carriage horses, the sudden refusal in hitherto and usually tractable animals to proceed on their journey.

The effect of *fear* in paralysing motion—including the vocal muscles and voice—has been observed in chickens by Spalding: the animals become at once motionless and dumb, as do so many others under similar circumstances. In other

cases the respiratory muscles are affected: respiration is suspended; there is inability to breathe as well as to utter sounds of any kind—for instance, in the cat (Pierquin). Loss of voice—silence instead of barking—may be caused also by exuberance of feeling of any kind in the dog (Cobbe).

The paralysis resulting from *fear*, fright, or other emotions, though usually of a general, may also be of a special character, confined to a limited group of muscles. Thus one of its forms is *relaxation of the sphincter muscles*, and involuntary escape of various evacuations.

We have not yet done, however, with the *motor* phenomena resulting from emotional disturbance.

1. One of the most singular of the physical effects of emotion is the falling to pieces of the *ophiocoma*, one of the so-called brittle stars, and the dismemberment of other star-fish, such as the spiny star, the casting of their rays or limbs under sudden alarm or irritation, as may be seen in the Brighton or other aquaria. Hartwig dwells on the 'facility with which the crustacea cast off their legs, and even their heavy claws, when they have been . . . . alarmed at thunder.' Somewhat similar seems to be the case of the porcupine, in which, 'if strongly excited when the quills are loose and ready for moulting, the violent jerks with which it manifests anger have the effect of dislodging the most loose among them, and they are then mechanically thrown to some distance from the animal' (Sclater).

2. A more familiar *motor* phenomenon is the erection of the frill of the neck or head, of feathers, or of other appendages of head, neck, or throat, under fear, fright, anger, fury, or the desire to fight—a phenomenon considered in the chapter on 'Non-vocal Language.' The bristling of the hair in the cat belongs to this category.

3. Another motor form of physical effect is to be found in *vomiting*, as exhibited by the palmiped birds, such as the sea-maw (Houzeau), the frightened canary, and other animals under fear or fright. And intimately associated therewith, and provocative thereof, is *nausea*—sickness which is manifested now and then in exceptional cases—from grief, joy, or other forms of excited or depressed feeling. Various

gulls disgorge the contents of the stomach on being alarmed (Montagu). The dog is sometimes 'violently sick' from mental shock or from joy (Cobbe).

4. Morbid motor phenomena include, further, various aimless, frequently *violent, movements*, such as flying to and fro in small cage birds under fright or fear—movements that involve dashing against all manner of obstacles, and that lead thereby to self-injury, frequently of a fatal kind. The kicking, rearing, plunging, of terror-stricken horses belong to this category. So does the very different restlessness of the terrier, accompanied by tail-shakes and whines, when he intimates discovery of a rat and expresses his satisfaction and eagerness.

5. Brunton refers to movements of the *bowels* as significant of, and produced by, love in parrots, and it is probable that emotion acts in the same way on their peristaltic action as it does in man.

6. The development or evolution of *electricity*—for instance, from the bristling hairs of the cat under the excitement of anger or fear. The animal or its fur becomes 'charged' with electricity. It is probably under similar feelings—of annoyance at being handled or touched, which the animal may construe into indications of danger or attack—that the *gymnotus* and *malapterurus* discharge their electricity; for, as regards at least the *gymnotus*, we know that it has its battery quite under control, and that it does not use it when it is tamed and handled by its master.

Of *non-motor* phenomena, among the most common are—

1. Various *cutaneous exudations*, including especially perspiration or sweating; and

2. Strong *odours* of various kinds, mostly of a disgusting character, attached or not to cutaneous exudations.

3. The evolution of light or luminosity, especially in the form of so-called *phosphorescence*.

Profuse *sweating* under terror, and sometimes even under various ordinary forms of excitement, is not uncommon in the horse, while it occurs even in so unlikely an animal as the rhinoceros (Darwin). Tristram tells us that at the sight of the horned snake of Syria the horse not only trembles,

but perspires in every limb. Perspiration is a physical effect of the excitement of swarming in bees (Huber). Various poisonous cutaneous exudations are the result of irritation in certain animals.

The development of disgusting *smells* under alarm or irritation is exemplified in snakes (Jesse), the pigmy shrew, and certain other animals.

Foaming or frothing at the mouth in fury or rage occurs in the dog; and indeed the expression 'foaming with rage' is sometimes more applicable to other animals than to man. It must, however, be distinguished from the mouth-foaming, the saliva-churning of disease, such as epilepsy.

Starting, protruding eyeballs are various expressions of terror, hatred, ferocity.

To man practically the most important of the physical effects of emotional or mental disturbance are the—

1. *Vitiation* of the quality, changes in the chemical composition, of various of the principal solid and fluid constituents or secretions of the body of an animal—to wit, the blood, flesh, and milk especially—those solids and fluids that are so largely used as human food; and

2. *Diseased* general conditions—such as feverishness—or specific diseases in great variety, many of them dangerous to man, or involving great pecuniary loss to him.

None of the animal *secretions* is so important economically to man as the *milk* of the cow, goat, and certain other animals. Now, in the first place, milk may be given up or refused according to the humour or temper of an animal, according as it is angry, sulky, revengeful, or pleased, contented, happy—according as its usage has been kind or cruel, its owner, master or attendant judicious or the reverse. Cows and goats have a wonderful control over the secretion of milk, and over the giving up of that secretion. They refuse to give it up to, to allow themselves to be milked by, strangers or persons they dislike. They are easily irritated or excited, and when so, refuse to be milked (Pierquin).

This unwillingness to yield their usual milk-supply to man is sometimes overcome by him by the use of various expedients, and some at least are of such a character that their

success is importantly suggestive. Livingstone tells us that certain African cows refuse to give milk, save to their calves, and that the natives resort to the following more successful than elegant expedient to compel them to yield their milk to man also. They smear the teats with some of the cow's own dung. The calves are too disgusted to suck these dung-smeared teats. The result is milk-fever from the milk not being drawn off at all, and the resultant discomfort or pain leads the animals ultimately to succumb to the herdsman for the sake of physical relief.

On the other hand, a more elegant and equally successful mode of accomplishing the same end is, or was at one time, employed in the Scottish highlands, according to Miss Gordon Cumming, who says: 'The only thing I ever saw prevail upon a sulky cow to give her milk was to sing to her some mournful but sweet air whilst soothingly rubbing her udder. Two of the real orthodox songs for such airs' are mentioned by her as apparently still in use. 'I know that they have often, when plaintively sung, been known to overcome a cow's unwillingness to give her milk when all other means fail . . . . I have seen cows not give a drop when their calves were being weaned from them, or even if they were for a time deprived of any luxury in the shape of corn or potatoes they have been accustomed to at milking time. . . . Refusing the milk is the revenge a cow takes if in the sulks.'

The temper of the animal also frequently determines the *quantity* of the milk it yields, if it gives milk at all. But much more important is the change of quality, the development of noxious or *poisonous properties*, in the milk-yield under the influence of such passions as anger, rage, fury.

This influence of passion in altering the chemical composition of various *secretions* is, however, more familiar in the case of the *saliva* of the dog in rabies. There is no good ground for doubting that rabies itself is sometimes produced, and the saliva of the dog rendered specifically poisonous—so as to induce rabies or hydrophobia in other animals or in man when bitten by it, and the saliva thus inoculated—by the influence especially of the exciting passions, such as anger

in all its degrees. And herein again may be pointed out the serious *responsibility* incurred by those who provoke dogs to fury. Dr. Richardson of London, with whom I corresponded on comparative pathology a quarter of a century ago, and who was one of only two or three men in Britain—physicians or veterinarians—who at the time had any appreciation of the importance of that still new and little known science, writes: 'In the dog suffering from rabies it is, I think, beyond dispute that the poison in the saliva is developed in some cases spontaneously through the influence of rage or fear.'

Not only the milk, saliva, and other secretions, but the *blood* and the *flesh* of certain domestic animals, especially the ox, acquire deleterious or poisonous properties when the animal has suffered intensely or protractedly, either mentally or physically. Thus the flesh of tortured, overdriven cattle produces various forms of disease—usually more or less temporary and trivial fortunately—in those human beings who eat it as food. These diseases include various skin eruptions, gastric disorders and febrile phenomena, the cutaneous affections arising also from mere contact with the flesh or blood—mere handling it, for instance, by butchers. Deterioration or loss of flesh and fat, emaciation and inferior quality of the meat as food, with liability to actual and specific disease of the said flesh or fat, are the result of the excitement of being incessantly hunted, in Australian cattle (Baden Powell). In all these cases there is an obvious combination of mental and physical influences: it is impossible to separate the effect of mental excitement, of irritation, anger, fear, worry, from physical exhaustion, the result of intense muscular and nervous strain.

Such considerations—that milk and flesh used as food by man may be vitiated, even rendered poisonous to him or his children; or that in the saliva of the dog there may be developed a highly dangerous communicable specific poison, by the action on the nervous system of the cow or dog of such passions or emotions as rage or fear—bring us back to remark on the obvious economy and policy of man's kind or judicious treatment of domestic animals, especially of those

which supply him with food. We have shown the evil effect of bad usage in developing evil passions, which in their turn give rise to demonstrable vitiation of flesh, blood, milk, saliva, and other solids and fluids—demonstrable by the morbid physical phenomena produced in man or other animals using such solids or fluids as food. For we have seen that the poisoned milk of an angry bitch may produce in her own pup effects more serious in degree than—though of the same kind as—those produced in the human infant by the poisoned milk of the angry cow.

Per contra, it is at least equally desirable to remind the reader of what has been elsewhere said in this work of the effect on animal health and happiness of man's efforts to amuse, cheer, encourage, soothe, satisfy domestic animals—such as the cow and sheep. In the cow, for instance, such efforts tell at once and most favourably on the milk-supply—both as regards its quality, quantity, and the readiness with which it is given up; while they tell, also—less directly, of course, but not less satisfactorily—on the quantity and quality both of flesh and fat. Other things being equal, the well treated, happy cow is plump and comely, its flesh and fat are of first-rate quality, free from all disease and abundant as to quantity, while the milk-supply is unexceptionable. On the other hand, the ill-treated, wretched individual of the same species is lean and feeble, its flesh and fat are in sparing quantity and of inferior quality, vitiated perhaps or diseased; while the milk is also limited in amount, bad in quality, and the irritable or sulky animal may refuse to give it up, such as it is.

Unquestionably then it must 'pay' man to bestow some care upon producing content, happiness, good humour in his cattle, and in warding off all chances or sources of anger or fear. In other words, it has been abundantly proved—and those specially interested should never lose sight of the fact—that mental states artificially producible by man conduce to bodily health, and thereby to the suitableness and soundness of animal flesh and milk as human food. Thus that mere sociality—companionship—has a distinct relation to the fattening of cattle was long ago pointed

out by the observant White. Hence music, kindness—in short, all influences that tend to mental composure or serenity, to an easy mind and contented spirit, to personal happiness or pleasure, tend also and thereby to bodily soundness, to the healthy condition and the most nutritive quality of milk and flesh. Even then, when he is merely breeding the ox or pig for the meat-market, it is man's best policy, in a money point of view, to deal with them gently and kindly.

What may properly be called the psychological or *moral treatment* of food-animals for the sake even of their food—which is only one, however, of the good objects to be gained—cannot be said yet to have attracted attention in this or other countries. Nevertheless enough has been said, it is hoped, to show why it deserves notice, and how it may prove efficient in money-saving and in health-giving.

Pierquin gives a suggestive case of a cow in which sale to a new proprietor, involving removal from its master, produced at once a series of marked physical and mental effects, including sadness, passing into melancholia, food-refusal, and consequent muscular or bodily wasting. The animal's market value had already become materially diminished, when timely and judicious means were adopted for its recovery, simply by re-selling and returning it to its former owner. With the restoration of happiness that resulted, flesh, strength, spirits and no doubt milk-giving quality—all speedily returned, an important, though typically common, illustration of the *simplicity of treatment* indicated or required in so many of the mental and physical disorders of animals—the removal namely of the obvious cause of disorder and restoration to the *status quo*.

An interesting class of physical effects of mental states—of imagination on the one hand, and of the shock of fright on the other—is to be found in the impression created on *pregnant mothers*, and by them transmitted to, and organised in, their offspring. This is a wide and suggestive subject, one that does not appear to have been studied with the same care, or to the same extent, among the lower animals as in man. But that the same kinds of impressions are produced

under the same kinds of circumstances there can be little doubt. Daniell, for instance, shows how a mere passing fancy for—a glimpse at—some dog, on the part of a pointer bitch, so impressed her memory and imagination that she transmitted this impress in a physical form to her progeny.

Among other singular *maternal impressions* and their results may here be noted that *masculine* bodily attributes have been acquired by *female* animals from shock to maternal love—for instance, in the hen.

There are, again, numerous ordinary bodily ailments—including a variety of *specific diseases*—that are among other causes producible by purely mental states, purely emotional, or purely nervous, influences, though such states or influences seldom act *per se*. Thus Miss Buist tells us that 'terror, neglect, and cold are the causes of half the bird complaints known.'

Of all these specific diseases none is so formidable as *rabies*. In the dog inconsolable grief sometimes produces 'sickening' and 'dumb madness,' or other forms of rabies ('Animal World'); and the same terrible disease appears also to be the fruit of emotions of an opposite kind—such as anger, however aroused, especially if either sudden, and intense or protracted. It is producible also by terror.

Thus Fleming tells us that a very small toy-terrier of his own, which was travelling with him by railway, was suddenly terrified by an engine whistle. Rabies, that proved fatal in a few days, was at once developed. In all such cases every effort is made to connect the rabies with the bite of some other dog that may be presumed, if it cannot be proved, to have been rabid: an effort that is frequently futile, and that owes its being made at all to the popular conviction that rabies never arises spontaneously. There is sufficient evidence, however, to show that it is developed spontaneously in the dog, just as hydrophobia sometimes is in man—under the influence of powerful emotion—in the dog's case grief, terror, anger; in man's, fear and imagination.

Physical exhaustion is of importance, moreover, as a predisposing cause of serious results from emotion. Thus the shock of joy, which might not prove fatal to the healthy dog,

is so to an animal that has performed a long, weary journey, destitute of food, and exposed to all weathers, before it sees once more the master whom it loved and longed for so much. Hence the occurrence every now and then of dogs reaching their masters, mistresses, and homes only to see them for a moment and die of a consuming joy (Cobbe, Watson). Not only does the pregnant bitch sometimes lose her own life from joy, but the same exuberant emotion produces *abortion* —causes the loss of her whole litter of puppies (Cobbe).

CHAPTER XX.

INDIVIDUALITY.

ONE of the many absurdities committed by man, in his effort to create artificial or arbitrary differences or distinctions between man and other animals, is the allegation that the lower animals possess no individuality, one dog or horse being believed to be just like another in its character or disposition. The contrary, however, is the fact. Individuality is quite as strongly marked frequently in other animals, or certain of them—such as the dog, cat, and cage birds—as in man. There is both the strongest force and the strangest peculiarities of disposition, of both moral and intellectual constitution; and the behaviour may be so quaint or striking that a dog, horse, cat, or parrot may be, quite as truthfully as many men are, spoken of as itself a 'character'—an oddity by reason of its mental or moral peculiarity. These peculiarities include remarkable differences in—

1. Temperament and temper, amounting to idiosyncrasy; and in

2. Behaviour, feeling, thought, amounting to eccentricity; as this is illustrated by—

   a. Singular likings and dislikes, attachments and aversions.

   b. Other forms of whim or caprice.

3. Their special aptitudes—including the capacity for education and for the practical business of life.

4. Action in emergency.

We are referring at present to peculiarities of mental or moral character that distinguish individuals of the same species, whether these individuals be—

1. Members of the same family, as of the same litter of puppies or kittens; or

2. Of the same breed or race.

In the first place, just as in man, there are individuals that are to be considered—

1. *Geniuses*, gifted with conspicuous talent for song or with other accomplishments; or

2. Conspicuously the reverse—distinguished for their stupidity and their inability to learn, to profit by experience, to take care of themselves; while the majority are

3. *Mediocrities*—distinguished in no way, but quite able to take their own part in the struggle for existence.

Individual linnets excel in song (Bechstein). Particular dogs become 'learned' as performers on the stage, as co-operators with man in his various 'exhibitions,' or in his crimes. Certain horses distinguish themselves in a similar way in the circus, as do also special elephants, pigs, and many other animals that manifest a genius or talent for this or that kind of feat, involving exceptional, high and cultivated intelligence. Such animals are quick, equally in perception and action, susceptible in a high degree of training by man. Marked cleverness on the one hand, and stupidity on the other, have been noted in individuals, even of the same hive among bees, and among hares (Buckland). Of humble bees some are builders, simply useful; while others are artists, gifted with the faculty of ornamentation (Figuier). Of bull-finches taught to pipe, only a few distinguish themselves (Stanley). Of horses selected for circus-training only a few possess the necessary mental ability.

The general phenomena of individuality are most familiar —as they are most easily studied—in the *dog*. They are well illustrated frequently in the dogs belonging to the same master, exposed, therefore, to the same circumstances of life and treatment. Wood tells us of one that was 'a perfect aristocrat. Nothing would induce him to consort with vulgar people, to enter a kitchen, or descend the area stairs. He perfectly understood the importance attached to a large house and handsome furniture.' He was 'perfectly miserable' in shabby lodgings, while travelling in summer. He per-

sisted in rushing into handsome lodgings, pretending to have made a mistake as to the place; and his 'dignity was soothed' when his owner moved into apartments to his (the dog's) taste. Another dog liked carriages, but objected to cats.

On the other hand—and this character-contrast occurred in the property of the same master—one dog was as *vulgar* as another was aristocratic. The former is described as a 'thorough vulgarian in mind. He prefers bad company, lives by choice in the kitchen, is rude and unmannerly, never barks at a beggar, and delights in a general row or fight over a bone' (Wood).

A retriever of Berkeley's showed a detestation of labouring men as a class. A terrier belonging to a clergyman is described as a 'queer, faithful, blundering dog,' full of individuality, if not eccentricity, with a tendency to morbid peculiarities of temper and mind. It had a marked antipathy to its master's clerical costume of orthodox black; perhaps, it is suggested, because of having been 'accustomed to the light costumes of India.'

Much more probably, in such cases of *morbid* individuality, such phenomena of aversion are not mere matters or results of habit—present or former—but are the outcome of disease, involving the brain and general nervous system, the effect of climatic influences, such as sunstroke. The very same kind of changes in temper and thought, the same sort of irascibility, antipathies, delusionalness, or suspiciousness, arise quite commonly in men who are exposed, in the civil or military services, to the climate of India and of the tropics generally.

Singular—apparently causeless—unaccountable *aversions*, dislikes, or distastes, constitute one of the commonest forms of what may be considered a morbid individuality or eccentricity. *Unaccountable* ones, we say, because there are many others that are quite accountable and intelligible, that merely prove, in the animal exhibiting them, a memory of wrong suffered, with perhaps an associated desire for revenge. There are certain kinds of antipathy that are of a very marked character, and that are transmitted from generation to generation,

the original causation of which is problematical. Of such a nature is the rooted aversion so frequently shown by certain dogs, even while quite young, and utterly void of any experience of ill-usage—towards *butchers* or fleshers, their shops, clothes, and everything belonging to them that can literally smell of the shop, themselves, or their peculiar work. As has been fully shown by Huggins, Darwin, Ransom, and others, dogs express their feelings of detestation of butchers and their shops by—

1. Avoidance of both—passing on the other side of a street, or not at all entering a street, containing a butcher's shop, or the shop of some particular flesher.

2. The display of all manner of anger, rage, ferocity, and excitement, perhaps culminating in, or leading to, dangerous assaults upon man's person.

This special form of dislike and antagonism of dogs to butchers, with the ferocity to which it gives rise, sometimes pervades a whole breed of dogs. Of similar character appears to be the antipathy of dogs to vivisectors.

Dogs exhibit strong and strange dislikes in many other ways, of many other kinds, some of them explicable, others not. Thus certain dogs show a decided repugnance to, or hatred of, dog-stealers or of killers of stray dogs, regarding such men—and very properly so—as their enemies (Low). Here the cause or motive is intelligible; the antipathy may naturally arise from the fate the animal has seen befall its comrades, its mate, or offspring; possibly it may itself have escaped from the clutches of the thief or slayer.

But the equally frequent and decided dislike to strangers, simply as such, is not so easily explained. No doubt—in this and many other cases—a cause may be assigned and accepted; for instance, that the suspicious animal fears rivalry in the attraction of its master's attention or affection. At present, however, we have nothing to do with the *causation* of animal peculiarities; we have simply to note the fact of their existence.

Dogs exhibit antipathy to Indians, as horses also frequently do, in North America. The terrier shows a hatred of weasels and rats (Low). A female bull-pup of Mrs. Bur-

ton's had a singular dislike to Jews in Syria, taking a sly bite at their probably bare legs when it had the chance. Other dogs have shown marked aversion to particular articles of dress (Berkeley), or to its colours, or to certain colours in general, as well as to particular sounds.

Striking antipathies are far from being confined to dogs. I have been informed, by the proprietor of both animals, of the singular dislike of a pony to a particular horse; and it has to be noted in this case, as in many others, that a marked repugnance in one direction may co-exist with as decided a preference or partiality in another. This same pony exhibited a strong liking for certain other animals—especially a calf—of which it made a companion, to the great annoyance and jealousy of its own mother (cow). Cavalry horses frequently show special aversions to individual men (Houzeau); while Mongol horses resent the interference of all strangers—a fortunate circumstance that assists in the prevention of horse-stealing among the Mongols. A certain pet green linnet declines to pay his usual court to his mistress 'if she has anything on which he dislikes, especially anything of a *red colour*' ('Animal World'). Causeless hostility to particular persons has been noticed in the racoon, and aversion to children has been described in a lori (Cassell).

Quite as striking and strange frequently as certain antipathies are certain apparently unreasonable predilections, partialities, likings, preferences, attachments—giving rise to companionships and friendships of a remarkable kind.

Thus a singular attachment is mentioned by Belt between a young jaguar and the dog that had captured it: to the latter it became 'greatly attached,' living with it in harmony as a companion. And this is only a type of many similarly strange and harmonious *friendships* between the most unlikely animals. A local newspaper of high standing—well known to me—describes a sitting hen as hatching her young in a watch-dog's kennel (or couch). 'The two seem to understand each other so well that, on the hen leaving or entering the couch, the dog rises and makes way. . . . . Any attempt to abstract the eggs in the absence of the hen meets with the

immediate disapprobation of the dog,'[1] as signified by a growl. Again, a tame rook was very fond of two dogs, one a bulldog, 'being specially given to riding on their backs' ('Animal World'). Military and other horses show as special likings as dislikes—for instance, to particular men. They have their favourite masters or grooms, by whom alone they are manageable, refusing to permit any other persons to mount or approach them (Nichols, Youatt, Houzeau). Unaccountable friendships occur even among geese (Lloyd); and instances of causeless attachments, as of antipathies, of other birds to man are not uncommon (Darwin).

Among the commonest illustrations of the likings and dislikes of the lower animals are those connected with their taste or appetite for *food and drink*—and especially for the foods and beverages *of man*. One of the most frequently exhibited tastes for special articles of food is that for saccharine solids or fluids—not necessarily or only sugar or similar sweet substances prepared by man. Ants, for instance, show a strong liking for honeydew, as secreted and excreted by aphides. For sugar, however, as prepared by man, fondness amounts sometimes even to a passion in the dog (Cobbe), and may, if ungratified, beget fury in the horse. In such cases, as in the more common and more harmful partiality for the alcoholic beverages of man, taste or appetite may be described as not only acquired and artificial, but as morbid. Thus it must surely be a morbid appetite that leads the siamang to drink ink (Cassell).

And this *morbid appetite* in the lower animals is a subject of such extent and importance that it would require at least one chapter to itself to do it anything like justice. Here we can but refer to it *en passant*. One of its most serious forms —in connection with the development of morbid antipathies that lead, again, to other kinds of cruelty to their young—is *cannibalism* of offspring, devouring their own fledgelings or offspring, by ravens, and many other birds and other animals.

'If a parrot be presented with a piece of bread and jam, he will eat the jam and drop the bread,' just in fact as so

[1] 'Dundee Advertiser,' May 28, 1875.

many children do (Wilks). And here it so happens that the taste of the bird agrees with that of the child, and is therefore intelligible on the supposition that in both cases the sensation produced by the sugary material is pleasurable. But other instances of equally decided food-tastes among the lower animals cannot be so easily accounted for, if accounted for at all. Thus, as an illustration of the oddities of taste in certain animals, a correspondent of 'Science Gossip' writes of a cat: 'She would never under any circumstances drink milk, nor, if she could help it, clean water; but would greedily lap *soapy water* in which one's hands had been washed, seeming to prefer this to any other drink.' On the other hand, a pet hedgehog on board ship was 'very fond of milk,' and raw fresh meat was her favourite food. 'She would not taste any fruit except raisins, of which she was very fond' (Mrs. Mackellar). The chimpanzee has a special liking for roast meat, milk, wine, and sugared articles (Cassell). The camel has a marked predilection for garlic. Other animals show a preferential appreciation of tea or coffee, tobacco or other substances, solid or fluid, to which they are utterly unaccustomed in their natural or wild state.

Distaste for certain foods and drinks, natural or artificial, may be, and frequently is, as marked, as singular, as unaccountable, as is the taste for certain others. And in some cases, as in that of certain tastes, the cause is, or appears to be, obvious and intelligible. Thus Belt mentions a theftuous monkey that stole a bottle of turpentine, uncorked it, smelt it first with one nostril, then with another, and returned the bottle without tasting its contents, but making a wry face, as if in disgust, to the person from whom it was stolen. And here it is worthy of note that the animal showed unusual sagacity and caution in judging by smell and refraining from tasting the pungent liquor. But there was a curious incautiousness and injudiciousness apparently in its voluntary proclamation of its theft.

Belt also mentions a tame white-faced monkey that would never eat *heliconii* (a kind of butterfly). A certain spider of Nicaragua had the same food-aversion: it 'used to drop them out of its web when I put them into it,' he

says; whereas another spider seemed to be fond of them, as were also a wasp and a monkey. Again, the *lampyridæ* among beetles are distasteful to insectivorous mammals and birds. 'They were invariably rejected by my monkey, and my fowls would not touch them.' Again, we are told of fowls and ducks refusing a certain Nicaraguan frog. A young duck that snatched up one inadvertently, 'instead of swallowing it . . . . instantly threw it out of its mouth, and went about jerking its head as if trying to throw off some unpleasant taste' (Belt). But in such statements it is necessary to distinguish individuality in different animals of the same species or family from the characteristics or peculiarities of different *species* and genera.

It frequently happens that in the same individual there is a remarkable conjunction of likings and dislikes. This is most commonly illustrated in regard to articles of diet. The utia, for instance, has a repugnance to animal food, but a partiality for wine (Cassell). But such character-contrasts in the same animal at the same time extend also to its attachments and animosities to persons, and to many other features in its disposition and habits.

Reverting to *individuality in the dog*, some dogs may be characterised as matter-of-fact or prosaic, compared with others that are fanciful or imaginative, full of whims, vagaries, or crotchets. The latter animals take singular 'fancies,' exhibit marked caprice, form unaccountable attachments, indulge in eccentric habits of various kinds. Wynter tells us of a Newfoundland dog that attended every funeral in the neighbourhood, assuming, moreover, the place of chief mourner; and of a terrier that swallowed any number of crooked pins, but only crooked ones. 'He would bend them with his teeth before swallowing them.'

Dogs, again, show marked differences in mettle, in courage, moral or physical, or both ('Animal World'). Milan poodles are described as naturally serious, solemn, and steady, or as giddy and frolicsome (Watson)—a difference, however, that is frequently determined, even in the same individual, simply by *age*.

Breeds of dogs are distinguished by special mental, as by

physical, characteristics. Thus the bull-dog is characterised by ferocity, determination, tenacity of purpose, courage; the Irish setter by wilfulness and want of steadiness; the fox-hound by precipitancy or dash; the poodle by intelligence, the wide range of its educational capabilities, love of approbation, gravity; the beagle by pertinâcity, pluck, endurance (Low).

Cats, like dogs, frequently exhibit a kind or amount of individuality that amounts to *eccentricity*. Thus Wynter mentions a cat of his own that selected blotting paper on which to sit or lie. Clara Rossiter describes another as regularly pulling all the pins from a pincushion and laying them out on the table; 'and when the last was taken out, looking up into our faces with a most comical expression, and making us understand she wanted them replaced. However many times we stuck the pins in, she would as frequently pull them out.' Another peculiarity of this cat was her partiality for cut flowers, which she devoured one by one, removing them by means of her mouth from the vases in which they were contained. Wood tells us of a tom cat that was quite as *aristocratic* in his notions and habits as certain dogs already mentioned. 'Nothing would induce him—not even milk when he was hungry—to put his head into the kitchen, or to enter the house by the servants' door.'

Horses differ greatly in their tempers, fearlessness, or courage; some being fiery, while others are gentle and timid; some being confident and brave, while others start or hesitate, exhibit tremor or shying, at every unusual object (Low). In Nicaraguan *mules*, 'just as in man, there is every variety of disposition and ability. Some are easily led, others most obstinate and headstrong; some wise and prudent, others foolish and rash' (Belt).

There are great differences also in the disposition of *squirrels*; some being grave, others gay; some gentle, others fierce; some familiar, others sullen; some tractable or obedient, others the reverse (Cassell). The private dwellings of *beavers* bear marks of individuality of taste or otherwise in their construction (Houzeau).

Great variations exist in the character of common

domestic *poultry*. Thus while some cocks and hens are plodders, others are idlers, loungers or loafers; whereas some are peace-loving, tolerant, or submissive, others are bullies, tyrannical, pugnacious, quarrelsome, insolent, chastising and otherwise oppressing the weak, defenceless, or submissive; while some are restless, others are contented and domestic; whereas some are careless of their eggs or young, others show them excessive devotion; while in some there is keen intelligence in attending to their own interests, in others there is a kind or degree of stupidity that leads, among other results, to self-starvation; whereas some are timid, others show great courage—in maternity, desperation, or even under ordinary circumstances. Combe also refers to the differences of disposition among poultry brought up in the same farm-yard; for instance, the carefulness on the one hand, and the carelessness on the other, of the mother for her young.

Parrots and other pet birds, including the blackbird, canary, and linnet, have amiable dispositions or the reverse, peculiarities of temper or habit, special accomplishments or capabilities, whether of a good or bad kind, as their custodiers soon learn, to their cost or their delight, as the case may be. Every cage bird has its peculiarities of character, which deserve careful study by its custodier, says Miss Buist; and Rengger points out the sometimes striking diversity of mental character in different members of the same species of songbird. A certain green linnet that is kept in a library, 'being apparently of opinion that the volumes by which he is surrounded are his own property, always manifests signs of anger when any of them are displaced, on one occasion literally flying in my face for touching one.' It also shows 'a nice discrimination as to any change' in the dress of his mistress, or even of her ornaments ('Animal World'). Wood, who had thirty *canaries*, knew all of them by sight, and was so familiar, moreover, with their individual characters that he 'could anticipate how each bird would act under certain circumstances.'

Lubbock observed the differences as to intelligence in *bees* of the same hive, and Wallace, too, has pointed out the im-

portant diversity that exists in the intellectual power or capacity of bees. Lubbock also gives what he himself calls 'interesting illustrations of the individual differences existing between *ants*,' asserting, for instance, 'that there are priests and Levites and good Samaritans among them as among men. . . . It is remarkable . . . . how much individual ants appear to differ from one another in character.'

There are in other animals as in man certain *tests* of individuality—certain circumstances that bring into prominence the peculiarities of disposition or character of one animal as contrasted with another individual of the same species. These test-circumstances or conditions include the following:—

1. The condition of being placed *at bay*, involving *desperation* or despair.

One animal at once perceives the vainness of all efforts or attempts at escape; it therefore makes none, but quietly resigns itself to its fate. A second is too weak in will or body, or too much paralysed by fear or fright, to be able to resist or escape. A third magnifies the nature or extent of the danger, and it, too, becomes helpless. But in a fourth there is a development of courage and fury, even though the animal be naturally timid; it makes the most persistent and determined efforts at resistance or escape, however little the chance of success in either. Thus we may have courage or cowardice, fear or fury, submission or resistance, developed at the same time under or by the same circumstances in different members of the same herd, flock, body, or family.

2. *Failure* or discomfiture in effort—determines a great variety of action, according to temperament and character.

In one animal there is only stimulation to further effort, a repetition of attempts till success is achieved—resolution, courage, perseverance, hope, are developed; while another is at once and hopelessly depressed, becomes despondent, makes no further effort in the same direction, perhaps even becomes a coward as regards all other extraordinary action, however nearly such action may or might affect its own physical welfare.

3. *Bereavement*, again, produces in one female animal

apathy; in another suicidal melancholia; in a third renewed energy, exhibited perhaps in a speedy re-mating; in a fourth the development of kindly vicarious maternal feelings in the practical form of foster-parentage.

4. *Annoyance* or irritation.

One dog shows a silent contempt or indifference under the persistent petty worries to which it is subjected by others that are both literally and figuratively 'curs;' while another at once loses temper, resents the annoyance, and angrily punishes the tormentor. Here it is of interest to observe that there is, frequently at least, a correlation of good humour with *size* of body, the largest dogs being usually those that are most magnanimous and even-tempered, and the smallest those that are figuratively, as well as literally, the most 'snappish.'

5. *Education*—at once distinguishes the clever from the stupid, those that are capable from those incapable of improvement by instruction.

6. *Disease* of all kinds, bodily and mental, such as rabies, distemper, and insanity.

To *morbid conditions*, physical or psychical, are undoubtedly due many of the otherwise unaccountable and singular *eccentricities* of the lower animals. In many cases these conditions do not manifest themselves at the time by any other outward expression; but in others there is a consociation of the eccentricity with some marked morbid condition, such as epilepsy. Thus the remarkable behaviour of certain dogs and cats is in all probability due to the same morbid condition of brain or nervous system that in them gives rise also to epileptic 'fits.'

Hitherto we have been speaking of psychical peculiarities of *individuals of the same species*, of members of the same family, brood, flock, or herd. But it is proper here to note also that there exist correspondingly more marked and equally important mental and moral differences in *different species*, genera, classes, and orders; these differences, as a rule, which, however, has striking exceptions, being greater—

1. As we rise in the zoological scale.
2. In domesticated animals; and

3. In those most intimately associated with man.

Thus monkeys and apes, as a group, are characterised by their vivacity, cleverness, mischievousness, impetuousness, inquisitiveness. Some genera or species thereof, however, possess what may be termed a negative character, in so far as there is a conspicuous absence of the mental or moral peculiarities of the great group to which they belong. Thus Baird points out that even some of those monkeys usually supposed to be vivacious, and rapid equally in their ideation and action, are in reality slow in both. They are slow in understanding a thing—in realising their own position, for instance, in reference to danger—and equally slow, perhaps fatally so, in taking proper action even when they do realise their peril. Some of them, no doubt—and this is certainly true of many other animals—may be 'slow, but sure'—slow in order to be sure, thinking and acting deliberately, action being characterised by caution and propriety when there is a conviction of its necessity. There is said to be an absence of the usual curiosity, attachment to persons, and gratitude of the tribe in the Tamarin monkey, and of the habitual petulance and malice in the marmozet (Cassell).

According to Professor Flower, the Indian and African elephants, two different zoological species, have different mental as well as physical characters, the African being 'bolder, quicker, and more obstinate' than the other. Here we have an illustration of the adoption by a zoologist of a *psychical character* as an aid in the diagnosis, description, and nomenclature *of a species*. It is not by any means a good illustration, inasmuch as mere degrees of boldness and obstinacy are not characters of a very definite value. But it is an admission that mental characters may in some cases take their place alongside of, or subsidiary to, structural ones in zoological classification. Dr. Baird, too, speaks of the different dispositions that characterise different species of the same genus—for instance, in the gayal and buffalo.

Ant-genera and species differ as remarkably in intelligence, including their power of rapid intercommunication of ideas, as do many animals much higher in the zoological scale; and their comparative superiority or inferiority in this

respect gives them advantage, or places them at disadvantage, in the struggle for life. Thus *polyergus rufescens*, though smaller than *formica sanguinea*, usually beats it in the fight, because the former understands its fellows more quickly and easily (Forel); and hence also certain ant-genera or species are habitual *masters*, while others are habitual *slaves*. Kirby and Spence draw a contrast as to temper and temperament between the humble and hive *bee*.

Not only, however, do animals possess mental peculiarities of their own, but they recognise them in each other, as well as in man, and take practical advantage or make due use of them.

Thus as regards the recognition of each others' peculiarities, whether mental or bodily, or both, a collie sometimes knows each sheep in a large flock so well that it will 'single out and bring home any particular sheep' (Wynter). Dogs distinguish friends from foes among other animals as well as among themselves; they recognise kinsmen or those belonging to the same community. Ants recognise old comrades or soldiers of the same army.

As regards the recognition of *human individuality* or personality, dogs frequently know not only all the members of a human family, but their names, ranks, and belongings. They distinguish friends from enemies among their masters' visitors, and act accordingly. The horse, too, frequently takes advantage of its rider's timidity, ignorance, inexperience, inebriety, weakness of will, or other defects of character, which are very speedily discovered by the animal.

Diversity of mental or moral endowments or aptitudes in different individuals is, or ought to be, the basis of all proper *education* or training. The kind and amount of education should be adapted to the capacity of the pupil, whether in man or other animals. It is a folly to expect the same results from the same mode of training in different individuals of the same species, or members of the same family, litter, or brood; and still more, of different species and genera. Thus timid dogs, like timid children, require encouragement, while forward ones demand repression or check; the dull

or slow must have easier and fewer lessons than the quick and clever. In short, in order to produce the same or the desired results, the greatest *variety of treatment* is necessary; and it is in the proper variation of his treatment, the due accommodation of the means to the end, in each individual pupil, that the teacher or trainer exhibits his competency, intelligence, ingenuity, temper, and tact.

CHAPTER XXI.

SENSITIVENESS.

WHAT is called *sensitiveness* in man occurs equally in other animals, and in them it is a subject of the highest importance in relation to man's treatment of them. Many of man's errors of treatment, much of his ill-usage of subject animals, unquestionably depend on his belief that other animals have not the sensitiveness of man, that they do not even feel physical pain. It is, therefore, of the utmost importance to show that the lower animals, like man himself, are sensitive—frequently highly or morbidly so—to impressions or influences that are either—

1. Simply physical.
2. Purely moral or mental; or
3. Conjointly physical and psychical.

Of such influences, the most important in reference to our present subject are those that are mainly or exclusively *psychical.* They include, however, so long and varied a category that it is only possible and proper to give illustrations of their character and of their *modus operandi.*

Sensitiveness to mental or moral influences occurs in many animals in whom it would certainly not be looked for by those ignorant of the true characters or capabilities of the lower animals. Thus Pierquin mentions a tame wolf that felt much its mistress's absence—to such a degree, indeed, that it refused food, while at or on her return it exhibited an ecstasy of joy so intense that it proved fatal. Houzeau, too, has cited a case of the death of the wolf from grief.

In the dog and elephant especially, all sorts of *ridicule,* including sarcasm or satire, are keenly felt and often dan-

gerously resented: they have the same kind of dislike that the human child has of being laughed at, of being made a fool or butt of, for instance, in or by the practical jokes of man. The siamang is indignant under ridicule (Cassell). Of one of his fighting dogs Berkeley says, 'Nothing hurt him more than to pretend to laugh at him.'

Of a Skye-terrier, Romanes says, 'Nothing that could happen displeased him so much as being laughed at, when he did not intend to be ridiculous:' for dogs and other animals perform many of their tricks with a special view to man's amusement, in which case his laughter is accepted as the expected expression of his commendation, the wished for indication that their efforts at pleasantry are successful. 'The signs of dislike,' in this terrier, 'were unequivocal.' If ridiculed when unsuccessful in catching flies on a window pane, he was 'evidently much annoyed.'

Similar wincing and anger under ridicule were exhibited in another Scotch terrier, which worried by mistake an imitation toy cat and was laughed at for his pains by his mistress and her visitors (Wood). In such a case a dog may be sensitive enough to feel the additional affront of being laughed at by a mistress in the presence of strangers: it may consider itself affronted 'before company,' as a child would.

Many other instances are on record of dogs hating to be mocked or in any way made mere game of by man. Of one we are told that he could not bear to be laughed at. 'If a stranger laughed at, or even pointed to him in fun, he felt insulted' ('Animal World'). In this and in similar cases, a dog will suffer a master to do what a stranger must not dare. He may regard the one as privileged to make fun of, as well as with, him if he will, and he takes it in good part, or at least passively. But the very same action on the part of a stranger may be fiercely, and even dangerously, resented, and he will be wise who accepts the first furious growl of the indignant animal as a danger-warning.

Again Darwin remarks, 'Several observers have stated that monkeys certainly dislike being laughed at;' to which Romanes, who lives in the neighbourhood of the Zoological

Gardens, London, and is familiar with their animal occupants, adds, 'There can be little or no doubt that this is true of monkeys.' A tame Siamese ape was much annoyed when persons, with whom he sat at table, burst out laughing at any of his ludicrous contretemps, and he would express his indignation equally by look and voice-sounds (Wood).

In the elephant the results are sometimes serious to the poor animal itself, for man's *sarcasm*, irony, satire, ridicule, applied it may be experimentally, have led it to attempt work utterly unsuited to its strength ('Percy Anecdotes'). Verbal taunts of cowardice or laziness are peculiarly galling to a high-spirited animal, that probably feels, moreover, how undeserved such insinuations are (Watson).

Such appreciation of man's sarcasm, conveyed as it necessarily is in man's words and phrases, involves, of course, a knowledge or understanding, to a certain extent at least, of man's language. And the same remark applies to numerous dogs and cats that take offence at what man says, not what he does. As is shown in the chapter on the 'Understanding of Man's Language,' dogs and cats—or certain of them—are quite aware when their masters are speaking of, though not to, them, and can distinguish between disparaging remarks and those of an opposite kind.

In regard to a certain cat, 'to laugh at him was an insult which he could not brook,' and if laughter at his expense was persisted in, he would sometimes slowly march out of the room with every mark of signal displeasure (Wood).

Sensitiveness to ridicule may indeed be said to be common among the domestic animals, and more especially among high-bred dogs (Wood).

They have equal dislike to be imposed upon: they detect and resent *imposture* of various kinds, as practised especially by man, and they give vent to their outraged feelings in various ways, according to their individuality and to the species and genus of animal deceived.

Affront, *insult* or indignity of all kinds, or what they may so consider, even when it is not intended, for instance, by man, is keenly felt by many sensitive dogs and other animals. They become passionate, angry, furious, under

insult, and can readily be rendered so experimentally by man. In various ways they resent it. The dog treats insult as man does, in the most opposite ways, either by contempt or punishment (Cobbe). The horse is apt to repay it with revenge (Low). In the preacher, Guereza and other monkeys, intentional or experimental insult by man gives rise at once to various degrees and exhibitions of rage or passion (Darwin). Birds insult each other (White); and the camel deliberately offers insult to man by that most unmistakable of all modes used by man himself to brother man—spitting in his face.

On the other hand, animals have a sense of personal *dignity*, and in a certain way they assert or exhibit it. Thus the military horse shows in its gait and general behaviour the sense of its own rank, which is involved in an appreciation of that of its master, while dogs and other animals illustrate the dignity of parental authority.

Of certain of his setters and pointers, Berkeley says it is 'offensive to their sensitive minds to call in extra assistance' in picking up game: it is felt to be a slur upon either their capacity or willingness to discharge their duty.

The sense of *degradation*, disgrace, humiliation, failure in or futility of effort, non-success, ignominy, dishonour, servitude, manifests itself in diverse forms, in deposed chiefs, in animals that have suffered defeat or discomfiture in the fight, in others condemned to slavery or to labour which they consider unworthy or undignified. Pliny long ago pointed out that elephants deprived of their insignia of rank in pageantry are apt to die of chagrin or melancholia.

In song birds beaten in rivalry, silence is a significant expression of their sense of inferiority, their *mortified pride* ('Percy Anecdotes'). The feeling of being superseded caused a dog to refuse food, and no persuasion or inducement could prevent his leaving his home at once and for good (Watson). The wild horse shows its sense of disgrace when punished by its fellows ('Percy Anecdotes'), and punishment produces the same effect in other animals. A common result of *defeat*, a frequent expression of the sense of defeat, is dejection

(Watson), accompanied usually by self-seclusion, surliness or sulkiness, and other changes of character or temper.

The feeling of *shame* is expressed under a great variety of circumstances in such animals as the dog and cat, connected with a sense of *guilt*, of having committed offences against man's commands of one kind or another. Certain highly sensitive animals, specially apt to be pricked by the stings of conscience, may be said to be, just as certain sensitive children are, 'shamefaced,' showing their shame readily and unmistakably. The cat, for instance, is frequently shamefaced under consciousness of a fault. Failure in the discharge of a duty, self-conviction of a fault, the feeling of being a culprit, all beget, or are at least apt to beget, shame.

Sense of wrong, injury or *injustice*, as inflicted especially by man, manifests itself in various ways in working and pet (domestic) animals—in those, for instance, that are overburdened or over-worked. This sense involves what man's drudges feel to be man's misjudgments, as well as man's ingratitude.

Many animals—especially the dog—are susceptible to *praise* and *blame* from man: they are cheered or encouraged by the one, disheartened by the other. They are easily annoyed, their feelings are readily hurt if *praise* is simply withheld when it is looked and longed for. Praise, especially when it can be honestly awarded, is of the utmost consequence in the education or training of the lower animals, and in the encouragement to their peculiar work of those that are man's servants. It may be given in a great variety of ways, by look, word, gesture, as well as by substantial rewards or bribes.

The *love of approbation*, the craving for commendation, is as strong in the dog, horse and mule as in the child. They show practically their gratification at man's approval, however that approval may be expressed. It is this love of man's approval or praise, as well as their longing for his affection or attention, that leads pet dogs to seek restitution to man's favour, when, for any reason, they have lost it. They make all efforts to re-ingratiate themselves, and reinstatement causes immediate and visible elation of spirits (Cobbe).

Dogs and other animals have an equally keen sense of man's disapproval, as expressed by rebuke, reprimand, reproof, reproach or any other form of *blame*, especially if this blame be merited on their part. Scolding in all its forms produces a remarkable, immediate and sometimes even a serious effect. Distress may be extreme and disproportionate, for instance, in sporting dogs. Things only said *of* a dog by a master, if his expressions take the form of blame, at once produce sometimes shame or dejection (Watson). His reproving looks are equally well understood. Some dogs are in misery so long as they feel or see themselves under a master's displeasure. In other words, just as pleasure is the result of man's approval, pain is the effect of his disapproval. Man's blame may be conveyed in specially offensive and irritating ways, in taunts or upbraidings, associated with ridicule or sarcasm, in which case the moral result is much more serious than in ordinary reproof. Sarcastic taunts are only too apt to sink deeply into, and to rankle in, the minds of highly sensitive animals.

A lady writer in the 'Animal World' tells us that her dog 'dreads words of displeasure even more than the whip,' and this appears to be the case with many other dogs. In other words, *moral* reproof or *punishment* is frequently felt to be more severe than that which is simply or directly physical; and what may appear to be a purely bodily punishment has its moral effect, being regarded even by the animal culprit as an expression of man's displeasure. Highly trained dogs, that are intimately associated with cultivated man, have a great and salutary dread of his reproach, verbal or other.

As has been already stated, *encouragement* is of the highest importance in the training and treatment of animals useful to man, and it is important to note how simply, with how little trouble to man, in how many different ways this can be accomplished. There are very few animals that do not require to be, or that are not, at least, the better for being cheered in various ways in the execution of tasks or work that must be most uncongenial. The necessary or desirable kindly cheering can be effected equally well, in different cases,

by look, voice, caress, conversation or music. The peasants of Cornwall used, about the beginning of the present century, to cheer their plough oxen 'with conversation, denoting approbation and pleasure' conveyed in a sort of chant, expressive of tenderness and affection, says the Rev. Richard Warner, of Bath ('Animal World'). And numerous are the recorded instances of the beneficial effects of *music*, vocal or instrumental, on cattle, sheep, goats, horses, elephants and other animals. Encouragement is required in the use, as in the training, of sporting dogs (Walsh). The horse is readily cheered by the voice of its rider or driver (Low).

On the other hand, *discouragement*, or the simple want of encouragement, begets peevishness; and punishment, especially when habitual, cruel and unjust or disproportionate, produces results of a much more serious kind. In the young horse, especially if high-bred, punishment is apt to produce dejection or broken spirits (Pierquin). Castigation, particularly if habitual, produces nervousness, frequently intense in degree: even the mere fear of this or other forms of punishment may produce the same result (Youatt). Forming apparently, as does also the dog, strong opinions as to the propriety or justice, impropriety or injustice of the punishment inflicted on it by its tyrant—man—it protests, like the dog, against *unmerited* chastisement (Youatt).

So fond are they of notice or attention on man's part, that many pet animals suffer for, and from his mere *neglect* or indifference, and they are apt to construe into slights a simple want of attention caused by pre-occupation or non-consideration. The spaniel and other dogs *petition* for man's regard. Man's neglect may lead to mental depression, even of a permanent and serious kind, in the dog (Cobbe), which keenly feels what he considers non-appreciation by his master ('Animal World'). Slight or neglect from him, whether real or imaginary, preys on its mind (Blaine)—such is the longing or hungering for his love; just as it does in children that crave, in the same way, perpetual caresses or other signs of regard. Many pet dogs and other animals find it impossible to endure insignificance (Helps). '*Aut Cæsar, aut nullus,*' seems to be their feeling: they must

either be the pet of the house, or no pet at all. The sense of the temporary absence of a master's love, or of its usual expression, is shown sometimes by a grief quite as extravagant or violent in its manifestations as in the child. On the other hand, the sooty mangabey and other monkeys obviously feel flattered by man's attentions (Cassell).

Connected with man's neglect is the transfer to other pets of affections that were once exclusively their own. Partiality, real or supposed, of a master or mistress at once begets *jealousy*, and there is no passion that burns so fiercely in either the animal or human breast, none that leads to more avoidable unhappiness and crime. Horses, dogs, song-birds, elephants and other animals feel all the pangs of *rivalry*; and, as has been shown in other chapters, this emotion may lead even to death itself—directly or indirectly. They suffer also all the tortures of *suspense*.

Certain menagerie or other captive animals show a decided dislike for *publicity*, to being stared or looked at, to being made a show of. Thus the male hog-deer of India is highly nervous in the presence of visitors. When forced out of its house in the London Zoological Gardens it betrays immediate and considerable excitement, dashing 'about the enclosure as if frantic, leaping high in the air' (Wood). And such behaviour is not to be wondered at in the case of many animals that, in a state of nature, go forth only at night, or that are naturally solitary and unaccustomed to the disturbing sounds and sights of menagerie life. Possibly, in some cases, their sense of personal *modesty* is shocked, or their love of domestic *privacy* is violated; or there is simply an aversion to strangers, depending upon a natural or morbid shyness or coyness. Baboons and other animals resent the intrusion of strangers, jealously guarding the privacy of their homes (Cassell).

On the other hand, just as is the case with so many children, the sooty mangabey, and other monkeys, manifest active delight at the sight of strangers (Cassell), a circumstance based no doubt on the necessity that exists, in other animals as in man, especially in the stage of youth, for *novelty and variety* of scene and companionship.

This love of change, again, is closely related to love of *excitement* and *amusement*. The titi monkey requires as constant amusement as the human child does, becoming restless, mischievous, troublesome otherwise (Cassell). Other monkeys tire as readily and rapidly as a child does of toys, show the same kind of *fickleness* in their amusements (Baird).

Various animals, especially those accustomed to the society of refined, cultured man, appreciate highly his courtesy or *politeness*, respect or deference. They thoroughly understand these sentiments, as expressed by his tone of voice, manner, look, behaviour. Thus the manner in which man declines or accepts an animal's thank or peace-offering, the mode in which he himself bestows a favour or attention of any other kind, the way in which he meets his dog's efforts at reconciliation—all simple little niceties of politeness—tell at once on the keen feelings of the observant animal. They appreciate even the semblance of *courtesy*, as expressed, for instance, in man's practical jokes, and they illustrate it themselves on the stage.

Man may wound or gratify—he may make an enemy or a friend for life, by some small difference of look or tone. This appears more evidently, however, from the effects of man's *temper* on his animal pets, especially of his anger—and of anger conveyed merely in a word. In different animals—dogs for the most part—an *angry word* from a loved and respected master has produced the following results among others :—

1. Convulsions, fatal or not.
2. Desertion of home, frequently permanent.
3. Loss of all esteem and affection for their master.

Berkeley says of certain of his pet dogs : 'If I give these dogs a hastily angered word in my room, though they have never been beaten, they will, with an expression of the most dejected sorrow, go into a corner behind some chair, sofa, or table, and lie there' till told they are forgiven (Wood). Here apparently the fault is entirely one of temper on the master's part : the poor dogs have committed no misdemeanour, yet are led to believe that they must have done so, or at least that they have incurred their lord's displeasure.

On the other hand a gentle word, or even a kindly look, has frequently a remarkable effect on the pariah dogs of the East, accustomed only to harsh usage, but nevertheless highly sensitive to the beneficent influence of *kindness*, however expressed (Watson). An Irish terrier was 'exalted to the skies by a kind word,' just as he crawled 'on the ground in utter abasement if scolded' (Wood).

There can be no doubt that dogs *read* or interpret correctly and rapidly man's harshness or passion alike in his looks, manner, tone, as they understand it also when embodied in words, and thereby they form estimates of the degree of his displeasure. A single angry word from a master has caused convulsions in a young dog (Blaine). The dog takes offence, also, at a harsh, unfriendly tone, or angry word, and shows its sense of offence in various ways; for instance, by desertion of its master (Watson, 'Animal World').

Certain dogs and other animals appreciate and punish what they consider, and what is, *impertinence* or *impudence*, whether in their young, their fellows, in other animals, or man. Birds, such as the sparrow, recognise and resent or punish impertinence—for instance, in courtship; and the larger breeds of dogs frequently chastise the impudence of little curs.

Certain animals give evidence in various ways of the possession of *pride* or vanity; and wounded pride or vanity, where it occurs, is of the same character and leads to the same results as in man. These results in the lower animals include even insanity.

Necessarily associated with personal pride is the love of *admiration* in such birds as the peacock, Whydah bird, bird of paradise, or turkey. They look for admiration—man's, as well as that of females of their own species; feel that they deserve and can command it; exult in it when bestowed; and suffer from its being withheld. Many brilliantly-plumaged birds take and show pride in their personal beauty, in their plumage, or in their power of song.

Military horses, elephants, and mules have a pride in their rich caparison, their insignia of rank, in the pomp of

procession, or war (Youatt). The cat is proud of her kittens and the bitch of her pups. The hen is equally proud of her maternity.

Under this head a passing reference may be made to *self-esteem* or self-respect—the sense of personal *honour* or integrity—that are as apt to be wounded in the dog as in man (Watson).

The sentiments of *disgust* and *contempt* are felt and expressed by various old sporting dogs, under such circumstances as these:—

1. Their efforts being rendered futile by the precipitancy of the young.

2. The sportsman missing his aim, or giving other evidences of his incompetency.

3. The stale or putrid condition of food (Walsh).

4. The presentation of food that is simply unpalatable.

Thus sporting dogs have summarily deserted a sportsman in disgust at his non-success as a marksman, his missing fire or not hitting his game; his trifling, dilatoriness, or stupidity in the loss of opportunity, or his other indications of incapacity (Watson).

A dog of Monteiro's freely showed her contempt for the natives (Negroes) of Angola, as so many European masters do. The dog, too, shows *disdain* on being deceived by man (Watson).

A fighting dog of Berkeley's 'was so disgusted if any one danced before him that he went and sat down with his head concealed beneath a tablecloth or sofa-cover.' Even chickens show disgust at unsuitable food (Spalding); and the same emotion has been expressed by the pike (White).

The *sympathy* of the dog for human suffering or trouble sometimes begets suffering in the animal itself: it cannot see a master or mistress ill, confined to bed, without itself becoming depressed or unhappy; and this misery may continue during the long illness of its human friend and companion. The very keenness of its sympathy with human emotion becomes sometimes a source of mental disorder.

In connection with sympathy may be noted the capacity or incapacity for giving, as well as receiving, *consolation*—for

instance, in the dog. On the one hand, in various kindly, considerate ways, it *offers* consolation to human sufferers; while, in its own griefs, it is sometimes inconsolable, disconsolate—*refuses* every kind of sympathy or consolation.

Many animals show every shade of *annoyance* or displeasure. A feeling of mere displeasure will cause a pet and petted dog to refuse food (Watson). The dog, or other animals, in proportion to their natural or morbid *irascibility*, are annoyed, moreover, at trifles. In other words, they are easily provoked, and the provocation may be altogether disproportionate to its immediate or exciting cause.

The irritability of the parrot—its susceptibility to being teased—is well known to its admirers; and the same may be said of elephants, monkeys, and other menagerie animals, in whom such irritability is the result partly of captivity, partly of their habitual subjection to irritation from man.

Many animals suffer keenly from *disappointment* or mortification of all kinds. Thus they show their disappointment when thirsty at not finding water (Houzeau), or at the non-gratification of other appetites, wants, or desires (Watson). Birds, dogs, cats, and other animals manifest *chagrin* at errors of all kinds committed by themselves, more especially probably when they are by man detected in a fault, or are otherwise by him convicted.

So many examples have been given in other parts of this book—for instance, in such chapters as those on 'The Bodily Results of Mental Causes,' and on 'The Moral Causes of Mental Disorder'—of the influence of such emotions, feelings, passions as *grief*, *terror*, *fright*, *anger*, *revenge*, *jealousy*, in all their degrees and forms, that it is unnecessary here to recapitulate, further than simply to remind the reader that their results include—

1. Death.
2. Disease of various kinds—mental as well as bodily.
3. Sudden paralysis of thought and action.
4. Remarkable changes of character or disposition.
5. Temporary or permanent colour-changes.
6. Motor derangement.

In the present, and in certain other chapters, sufficient evidence has probably been given of—

1. The *intensity*, acuteness, degree, quality, or kind of emotion or feeling that are frequently shown by the lower animals.

2. The physical or other *results* of emotion in them.

3. The *variability* of emotion—the changes of mood to which other animals are as subject as man.

4. The singular *revulsions* of feeling that are as apt to occur in other animals as in man.

5. The vivid, tenacious, or retentive *memory* or remembrance of affront, neglect, or injury, as well as of kindness or benefit—for instance, in monkeys, elephants, dogs, horses (Watson).

6. The natural, and sometimes morbid, love of *excitement* and *amusement*.

7. The greater *impressionability* of—

a. Young and old animals.

b. Females, especially when pregnant or parturient.

c. The sick or diseased—for instance, those suffering from rabies or sunstroke.

8. The *epidemicity* of emotion, and the results of the rapid communication of feeling by sympathy, imitation, and imagination.

9. The *demonstrativeness* or display of feeling, and the power of control that is, or may be, exerted over its outward expression; and

10. The various *modes* of its *expression*—a subject that belongs to the chapters on 'Language.'

Emotion, as we have seen, is sometimes so intense as at once to cause death. Of the *quality* of feeling, the most noticeable feature is what in man is called *refinement* of feeling, which is sometimes observable in dogs accustomed to the society of cultured man, as in certain pet dogs described by Berkeley. The *fine feelings* of many a dog are both easily and deeply wounded; how easily and deeply none, however, but a man or woman himself or herself possessed of refined feeling, can appreciate or understand.

Among the *results* of emotion that have not been otherwise specially described are—

1. Proneness to take *offence*—frequently at trifles, or where no offence is intended—a vivid or morbid imagination attaching ideas of offensiveness to the actions of man or other animals, a phenomenon treated of in the chapter on 'Delusion and Dreaming.'

Some dogs are quite as ready to *give*, as others are to *take*, offence (Houzeau, Cobbe). The dog takes offence at things merely said of him by man, and sometimes never either forgets or forgives them (Watson). The cat takes offence by refusing to eat, and indulging in prolonged, sulky indignation (Watson).

This readiness to take offence is usually associated with irritability of temper, and with a tendency to *suspiciousness*. It has been noted in a considerable variety of animals, including the parroquet (Davies), dog, elephant, the tocque and other monkeys (Cassell). Such animals are naturally or morbidly touchy or testy—what in man is called 'thin-skinned.' And what is of practical importance to man, this touchiness is only too apt to lead to retaliation—the repayment of offence, real or fancied, by offence, perhaps of a serious kind.

2. The *resentment* of wrong on the one hand, and the forgiveness or endurance of injury on the other.

3. Not the least important of the results of sensitiveness to moral influences is the remarkable susceptibility shown, especially by dogs, to those forms of remedial treatment in which *moral* influences predominate, or which consist exclusively of such influences.

The efficiency of what is called in man *moral treatment* is discussed in the chapters on 'The Treatment of Insanity,' 'The General Treatment of other Animals by Man,' 'The Moral Causation of Insanity,' and 'Education.' Moral treatment is as frequently, and in the same way, conducive to recovery from disease—bodily as well as mental—in other animals as in man; in other words, gentle usage, kind words, looks, and actions are more efficacious frequently than any boluses or drenches.

The dog especially, but also the monkey, elephant, horse, cat, and other animals, show the same *changeability or capriciousness of mood*, humour, temper, that children, and even mature men so commonly do. And these changes occur as suddenly and unexpectedly, follow each other with the same rapidity, and are marked by the same singular contrasts, 'from grave to gay,' or otherwise, as in man.

Thus in the dog, under ill-usage, but even without any apparent cause, love and confidence may turn all at once to hate and fear (Cobbe). In the titi and other monkeys pleasure, indifference, disgust, rapidly succeed each other, as in the child (Cassell). Passionate fondness is succeeded, gradually or suddenly, by the opposite feeling in certain birds (White). Notorious fickleness of temper occurs in the horse, as in Sir Walter Scott's 'Daisy.'

These marked changes amount, therefore, frequently to, or they include, complete *revulsions* of feeling.

The condition of *emotional excitability*—what is frequently, though not quite correctly, spoken of both in man and other animals as nervous sensibility—though the first condition usually or invariably includes the second—is produced or determined by—

1. Certain processes of *breeding*. Thus it is greatest in high, least in low, breeds of the dog.

2. Certain forms of *disease*—mental or bodily—or conjointly physical and psychical.

For instance, sick dogs are notoriously so hypersensitive that their illness, of whatever nature, is apt to be seriously aggravated by man's harsh or unkind tone, look, manner; and it is in such a condition of hypersensitiveness from disease that man's *anger* is so apt to produce the most prejudicial results, even to the extent of convulsions.

3. Certain artificial and unhealthy forms or conditions of life, including especially *captivity*, as illustrated in menageries or zoological gardens, or in caged pets, and in domestication.

The morbid general nervous excitability of female animals in the pregnant or *puerperal* state is illustrated by the common fact that the simplest or smallest disturbance of

themselves, their nests, or their eggs, in incubating birds, is resented as a serious molestation, and may lead to such results as cannibalism of the eggs or young.

The *epidemicity* of emotion is illustrated by many forms of *panic*, elsewhere mentioned in this volume. In a flock of Moufflon sheep the mere parting of a friend or companion causes, in some individual, distress, and even alarm—feelings that spread by sympathy so as to become general throughout the flock—and panic results (Youatt).

Of *mixed* or conjunct influences, physical and psychical, that in various combinations powerfully affect the lower animals, none are so important as those involved in the good or bad usage, kind or unkind treatment, of subject animals by man. For it generally happens that the same man who meets his dog or horse with a kind word and a gentle caress, treats him well physically, abstains from blows or other forms of unnecessary and undeserved chastisement, sees to its food, lodging, and general comfort and health. The natural result in the animal is general happiness, good temper, willingness to be of service, readiness to repay kindness, and to display gratitude, leading to pleasant relations with all men and other animals, with whom it comes in contact.

On the other hand, the same man that is irritable, cruel, injudicious to his horse or dog in word is too likely to be equally so in deed; the angry oath is too certainly accompanied by the savage kick or whip-blow. Food, shelter, and other requirements are probably unattended to, even when it is man's own selfish interest to give them every attention. And the natural result in this case is not only unhappiness and ill-health in the animal-victims, but viciousness, apt to become, by habitual ill-usage, incurable—a viciousness that includes all manner of infirmities of temper, with all practicable modes of revenge or retaliation, and consequently all sorts of dangers to man's own life and property, as well as to the lives of the ill-used animals themselves, and all other animals with whom they may chance to be associated.

Of influences that are usually regarded as more particularly, or as exclusively, *physical* are—

1. Ordinary bodily *pain*, however caused.

It is one of man's popular and serious errors regarding other animals that they are either insensible to ordinary physical pain, or at least that they are much less sensitive to it than man is. In other words, by man the sufferings of other animals from pain are either unknown, misunderstood, ignored, or underrated. The fact, however, is that other animals—in proportion probably to the elaborateness and delicacy of their nervous organisation—suffer pain in the same way that man does, and express their suffering, as well as their fear or dread of it, in many of the same ways. The dog does so, for instance, in rheumatic fever (Cobbe).

2. Weather changes of all kinds; but especially those connected with—

a. Humidity—as to rain and thaw.
b. Temperature—as to cold and heat.
c. Electricity or electrical tension.

3. Sensorial impressions, including especially—

a. Sound—particularly that which is musical.
b. Colour and form—involving what is called in man æsthetic taste.

Such influences, however, can scarcely be considered purely physical, because *sensation* is intimately connected with both thought and feeling; and even in man the perception or appreciation of beauty, of form, colour, sound, is generally regarded among the *intellectual* tastes.

Many animals are so susceptible to *atmospheric influences* that they are sometimes supposed to be gifted with a sort of prescience of coming weather changes—such as rain, wind, cold, heat, or thunder. They are popularly regarded as a kind of weather-prophets, forecasters or prognosticators, superior in some cases, it is averred, to the barometer itself. Among sensitive animals of this kind are to be mentioned the common crow (Baird and Houzeau); robin of England and Canada, and the blackbird of England (Adams); the porcupine (Adams); South American cattle, dolphins, and spiders ('Percy Anecdotes'); the swallow, duck, seamaw, heron, common fowl (cock), and other birds (Houzeau); the

cat (Houzeau), tortoise (White), dog, swine (Forster), and monkeys (Pierquin). The prairie dog, Gillmore assures us, is superior to a barometer.

There would appear to be the same kind of exhilaration and depression—mental and bodily—from climatic influence, in other animals as in man. They simply feel before, because more acutely than, man does the changes that herald further changes.

Ample illustrations have been given in other parts of this work of the influence of *music*, vocal or instrumental—

1. As a gentle calmative in states of irritation or excitement.

2. As a mild excitant in conditions of depression.

3. As a dangerous irritant in certain morbid states of mind or body, including the part it plays occasionally in the development of insanity.

4. As a stimulant to work of an uncongenial kind—to endurance, perseverance, strength, and energy, in ordinary domestic life, of courage and ardour in the war-horse or elephant.

5. As a means of refinement in animals whom man thinks it worth his while to subject methodically to its power. In other words, music is to be considered in other animals than man one of the fine (or refining) arts, one of which man might well make much better and more extended use in his training of them.

It is not, therefore, necessary or desirable here to recapitulate—the more especially that the subject of music, in reference to the lower animals, would require, to do it anything like justice, at least a chapter to itself.

In some animals, as in man,—

> Music hath charms to soothe the savage breast,—

while in others it begets intolerable agony. In all ages shepherds have sung or piped to their sheep, goats, cattle, in order to encourage them in their work, of whatever nature, including that of feeding and digestion, and so to render them contented and happy. In all ages, too, music of some sort has been employed as a means of producing docility,

placability, submissiveness; for instance, in the processes of taming and charming.

The subject of *æsthetic taste*—the appreciation of physical beauty, in form and colour—fell more naturally to be considered in the chapter on 'Courtship and Marriage;' for it is chiefly in connection with mating, and the inter-relation of the sexes prior to that event, that *beauty* of person is displayed by the male and admired by the female. Here it must suffice to say that pleasure and pain are derived from the contemplation of colour and form, as from the impressions of sound, just in other animals as in man (Darwin).

PRACTICAL CONCLUSIONS:

MAN'S TREATMENT OF THE LOWER ANIMALS.

CHAPTER I.

GENERAL TREATMENT.

If, as has been shown in other portions of this book, the lower animals, or, at least, certain of them—

1. Possess both feelings and ideas akin to our own.

2. Are highly sensitive, not to physical only, but also to moral, influences.

3. Are as capable as we are of the sensations of pleasure and pain, mental, as well as bodily.

4. Are subject to the same kind of diseases produced by the same kind of causes; and, in especial,

5. Are liable to mental disorders of the same character as those of man, and generally described as insanity.

6. Are subject, moreover, to bodily ailments of various kinds, resulting from purely moral or mental causes.

7. Possess moral, as well as intellectual, faculties, as capable of cultivation as those of man.

8. Are endowed with virtues and vices that may be developed or repressed by association with, or instruction by man.

9. By imitation, or otherwise, are so influenced by man's character as to become a reflex thereof, adopting his vices as well as his virtues; while

10. The results of good or bad education, fortunate or unfortunate experience, are hereditarily transmissible—

it must be confessed that man's treatment of subject animals leaves much to be desired. Those who have perused the preceding chapters of this book must be prepared for the admission, that man's attitude towards his animal slaves

or servants is very far from being what it should be, and what in all probability, it is to be hoped, it will yet be.

There is perhaps a much greater prevalence of injudicious treatment, or of neglect of proper treatment, than of deliberate ill-treatment. Many a man, when his errors in treatment are pointed out, may quite honestly exclaim in the words of Hood—

> It never was in my soul to play so ill a part,
> But evil is wrought by *want of thought* as well as want of heart.

Man's errors in treatment arise in all probability much less frequently from—

1. Intentional *cruelty:* a delight in witnessing torture and in the infliction of pain, involving a callousness to suffering; from selfishness, or cupidity; momentary passion, loss of temper, for instance in grooms, riders or drivers; wilfulness or wantonness; tyranny, or the iniquitous use of superior power; than from

2. Mere *ignorance,* for instance of the fact that other animals are sensitive to bodily pain.

3. *Thoughtlessness* or inadvertence, want of consideration or reflection as to the possible results of certain actions.

They also arise from

4. *Prejudice* or superstition, including foolish, groundless terrors, such as those relating to the 'madness' of dogs; or from

5. Mere *want of sympathy* between the higher and the lower animal, between man and his animal servant or slave.

6. *Contempt* for all lower animals, the result of a morbid or misplaced pride, an overweening idea of man's place in the zoological scale and of his importance as a moral and intellectual being.

7. *Injudiciousness,* often well-meant errors of judgment.

8. Carelessness or *neglect,* unintentional or unwitting.

Of all these *causes* of the popular errors that lead to so disastrous results in man's management of inferior creatures, by far the most important, prevalent, and powerful is *ignorance* of the natural history of the lower animals, and especially of their *moral and intellectual endowments.* For,

with the single exception of natural cruelty of disposition in man, which must be looked upon as morbid, it is this ignorance, in all likelihood, that begets all the other causes or sources of error. Man's ignorance as a cause of his cruelty is well illustrated in Italy, where, we are told, the inhumanity with which animals are treated 'arises from a belief that they have neither soul nor feeling.'[1]

A thorough knowledge of the true mental and zoological status of other animals, a realisation even of what is man's own interest or policy in the treatment of subject animals, would probably develop sympathy, dissipate prejudice, and lead to carefulness, consideration, and humanity. Hence the desirability, by all means, of dispelling ignorance and substituting knowledge of the rudiments at least of *comparative psychology*, and of inculcating lessons in *humanity* to animals as man's own *best policy*.

The following are illustrations of *man's errors* or absurdities in treatment, errors based on ignorance, or produced by the other causes already specified:—

1. The destruction of dogs or oxen reputedly 'mad,' which is tantamount to the premature or unnecessary slaughter of great numbers of innocent valuable animals.

2. The destruction of these or other animals whenever, from any reason, they become in appearance or reality unserviceable.

Such forms of injudicious butchery include, for instance:—

3. The poisoning of dogs when worms produce—as they frequently do—cerebral and paralytic, mental and motor, symptoms, and when the simple use of purgatives would probably restore to health and usefulness valuable animals (Cobbold); or for

4. Mere biting, probably under the absurd belief that all biting is, or may be, the result of rabies; or for

5. Mere infirmities of age or temper. No doubt there is specious ground for such Spartan practice—the destruction of the old or feeble, wounded or decrepit. It is beneficial in its result, 'the survival of the fittest.' But the same argu-

[1] 'Graphic,' November 14, 1874, p. 474.

ment applies with equal force to man, or, at least, to whole races and classes of men.

Apart altogether from those higher considerations that are usually dwelt upon by clergymen in their sermons on 'Humanity to Animals,' there can be no doubt that there is a true *economy* in a kindly considerate treatment by man of those domestic or other animals that are subject to his dominion. The motto of all who have any property in, or care over the lower animals should unquestionably be, '*Humanity is the best policy.*'

In order to show this clearly, it is desirable to draw certain contrasts between the relative nature, causes, and results of man's—

1. *Cruelty*, on the one hand; and

2. *Kindness*, on the other, in the management or training of animals.

The present volume teems with illustrations of both these antithetic forms of treatment: nevertheless it is proper here to introduce certain specific comparisons.

We take up first the subject of *cruelty*, its forms, causes, and effects, because it is unfortunately much more frequent or prevalent than its opposite—kindness. Nor is this commonness to be wondered at, considering the nature and extent of man's ignorance of the moral and intellectual constitution of the lower animals. In general terms then it may be safely said that cruelty evokes *all the worst* moral or mental qualities of an animal. It changes its character for the worse, frequently ruins it irretrievably. It produces such unfortunate changes in disposition, temper, or character, as dishonesty, sullenness, moroseness, cunning, deceit, treachery, undue wariness, ferocity, idleness, which amount to the *substitution of vices for virtues.*

In such animals as the dog and horse, on which man is so dependent for his enjoyment or welfare, cruelty, bad usage of all kinds, develops the following serious disabilities:—

1. General irritability, quarrelsomeness and capriciousness of temper.

2. Various vicious propensities, such as dangerous biting and kicking.

3. Nervousness, in various degrees of intensity.

4. Unnatural fear, timidity, suspiciousness, with delusions of the senses—leading to shying and bolting.

5. Mental excitement, frequently amounting to mania, as well as other forms of mental disease.

6. Rabies, or other forms of nervous disorder.

7. Stubbornness or obstinacy, resentment, and revenge or retaliation.

8. Crimes—such as theft and murder.

Many, if not all, of these morbid mental conditions constitute what veterinarians term 'vices,' which not only interfere with an animal's usefulness, rendering it unsaleable or depreciating its market value, but too frequently involve the utmost danger to human life.

Maltreatment of the cow produces not only viciousness of temper, refusal to be milked, including angry kicking over the milk-pails, but it causes loss or vitiation of the milk itself, ruining perhaps both its quality and quantity. Ill-usage of cattle leads to diseases of the flesh as well as of the milk, rendering the animals unsuitable for food, and hence unsaleable, or saleable only for their hides. Injudicious usage—not necessarily of the nature of intentional cruelty—begets fatal murrains and other diseases, epidemic or otherwise, that destroy large numbers of valuable stock. This subject, however, is more fully discussed in other chapters: for instance, those which treat of (1) the morbid bodily conditions produced by moral or mental causes; (2) sensitiveness; and (3) the causes of insanity.

Pierquin ascribes the caprice and malice of apes to captivity and bad usage. Crossness of temper, a fractious, cross-grained state of feeling is sometimes a characteristic of all the horses bred by a particular master (Pierquin). In the dog, utter *demoralisation* is too frequent a result of man's evil influence, in cases, for instance, where it is taught to steal, smuggle, deceive. The pariah dog of the East, where he is treated as a nuisance and a scavenger, is gloomy, spiritless or broken-spirited, as the result of man's systematic persecution or neglect; or he is savage and bloodthirsty, with a morbid appetite for human flesh (Poiret and Denon).

It is scarcely necessary to cite instances of the various *forms* of man's cruelty to the domestic or other animals. They are given, in infinite variety, in the Annual or other Reports of the Royal Society for the Prevention of Cruelty to Animals, and of similar societies or branches of it or them throughout the civilised world. In our own country it is scarcely possible to peruse a newspaper without the discovery, if we look for them, of illustrations of ill-usage by man of the horse, donkey, ox, dog, or cat. These, however, are only the glaring instances that have attracted notice and become public. They represent only those exceptional cases which are made the subject of legal trial, decision, and punishment. Of the much larger numbers that do not obtrude themselves before public courts of justice we can only form a guess. But it may be desirable just to enumerate some of the prevalent forms of man's cruelty that are obviously inimical to his own pecuniary interests, that illustrate his 'penny-wise and pound-foolish' policy, when any sort of policy can be said to exist at all in his treatment of those domestic animals whose welfare is really so bound up with his own.

1. The transit of cattle or other animals, without water or proper food, 'cribbed, cabined and confined' with no reference either to health or comfort, involving the injurious succession of long railway journeys.

2. Over-driving on hard roads and through towns, in glare and heat, of footsore and fattened oxen, including the injudicious use of the goad, spur or whip, of sticks or stones, to jaded animals, in whom, though the spirit may be willing enough, the flesh is hopelessly weak.

3. Unhealthy confinement in hot, close, dirty, unventilated or ill-ventilated byres, stables, kennels, styes, with utter disregard of the quality of the food and water supply.

4. Over-loading of beasts of burden, including the injustice and futility of punishment of the practical protests of over-burdened animals.

5. Man's *sports*, as illustrative of the wantonness of his cruelty, for instance in the battue-shooting of pigeons, now so common among our own aristocracy, including his de-

struction of 'game' animals during the pairing or breeding seasons, and his artificial creation in them of ferocity or mania.

6. The training of certain animals as *decoys*, involving the use of darkness, starvation, and putting out the eyes.

It should not require to be pointed out and insisted upon that, for man's own sake, the kind and amount of *work* imposed upon domestic animals ought to be carefully suited to their age, natural aptitudes, and varying mental, as well as physical, character or constitution. It needs, however, to be borne in mind, that what is suitable for one animal may be quite the reverse for another, and that there is great danger, either to the animal's own life or to human safety, in efforts at compulsion where it is unwilling, though able-bodied, or willing but feeble-bodied. The combination of too willing a spirit with too weak flesh or strength when stimulated injudiciously, suddenly or severely, is apt, as so often happens in the case of poor cab or dray horses, to lead to a signal breakdown, both physical and mental.

Over-work, combined frequently as it is with hunger and thirst, and involving great bodily fatigue, induces, if continued, a general loss of power, a general debility—both mental and bodily. Thus in the dog, and certain other animals, this mental debility is marked by delirium, and by a stupidity which leads the poor animal to knock against, instead of avoiding, obstacles (Houzeau).

Beasts of burden such as the llama, camel, horse and ass, when they have a sense, mental, moral or physical, of being over-burdened, frequently resent and protest against it in a very practical and effectual way. They lay themselves down and refuse to proceed on their journey, showing perhaps an utterly incorrigible obstinacy, in and for which all kinds of punishment fail. The obvious, common-sense treatment is to lighten the load, showing kindness and consideration as to its size or weight and position. No doubt some of these animals have a natural or acquired dislike to laborious occupations and are given to rebellion against any attempt to render them subservient, as bearers of burdens, to man's uses. They may rebel under a load that is not in itself

excessive, against any load-bearing at all. But in such cases the repugnance has probably been begotten by the memory of former over-loadings, and it may probably be got over by the judicious application of that heal-all remedy — both in man and beast—persistent *kindness*.

Nor need it be further dwelt upon that much of man's cruelty may be said to be of a negative kind, consisting as it does of mere *neglect*, for instance, of attention to the shelter of animals, to their proper food and drink, their personal cleanliness, their due opportunities for exercise, and the gratification of their natural and healthy appetites or passions. This neglect springs too frequently from misapprehension as to the necessity for such attention to the mental and physical well-being of animals; and this misapprehension brings us back to the subject of man's *ignorance*, and the desirability of his engaging in a proper study of the mental and moral constitution of his animal friends, pets, or servants, both in disease and health.

The uselessness or *impolicy* of cruelty, then, must become apparent to anyone who, with the necessary knowledge and experience of animal habits, gives himself the trouble of reflection.

On the other hand, *kindness* may be said, as a rule to which there are certain exceptions, to educe *all the better* qualities of an animal's nature; to develop good temper, gentleness, docility, confidence, obedience, and all the other virtues which are so essential to its usefulness to man. The beneficent influence of kindness is in fact incalculable. Frederica Bremer speaks, and properly, of the possibility of man's creating 'an ennobled race of animals' by better treatment. At all events, as Helps remarks, animal happiness is capable of infinite increase by man's kindness. Elsewhere in this volume it has been shown how sensitive the lower animals are to human kindness, how keen their memory of it, how important it is in all kinds of their education or training, including, for instance, lion-taming.

Among the *results* of man's kindness as regards—

1. The *pig*; it becomes a domestic pet, taking the place of the dog, acquiring new habits, such as swimming, and

following its master. In Ireland it is made a member of man's household, both literally and figuratively.

2. The *horse* of the Arab also lives in family with its master, having, like the pig, equal privileges with other members of the family, and it is even more petted than its companion—man. The great secret of horse-tamers such as Rarey, Sullivan, and Jumper, was the judicious administration of kindness, and so imparting confidence. This *confidence* is all-important on the part of the horse towards or in its rider, master or trainer, at once begetting, in the majority at least of cases of ordinarily unruly animals, calmness, quietude and submission.

3. The *dog* of the Scotch shepherd, which is its master's trusted friend and loved companion, as well as his intelligent and useful servant, and which in this case too shares his dwelling and his food, is, again, a veritable member of his family or household—is a very different animal from the street dog of a Turkish city.

4. Even the *ox* becomes man's associate, companion, and favourite—for instance, among the Hottentots, who treat their cattle with great gentleness and consideration (Watson and Pierquin).

5. The *elephant*, when tamed and trained in India, stands in the most intimate and friendly relationship to its 'mahout.'

6. The very *wasp*, the emblem of the acme or essence of ill-nature in man, has lately shown, in the hands of Sir John Lubbock, the power of man's patience, forbearance, and humanity in rendering it as tame, as placable and mild, as our various domestic animals.

Not only, however, does kindness *bring out* all the animal *virtues*, but it *represses* the animal *vices*. It is not only educational, but remedial. It softens, calms, soothes, or subdues surliness, ferocity, and fury; it corrects a multitude of vices of temper.

There are *exceptions*, however, to the generally beneficial or beneficent influence of kindness. There are every now and then, every here and there, individuals of various species and genera that are unamenable to its usual influence—

cases in which it signally *fails* to produce any effect whatever, or where the effect is the reverse of what is desired. Assuming that there is no fault on the part of the operator, that the kindness offered is genuine and judicious, such exceptional cases that resist the power of kindness almost invariably indicate the existence of some kind or degree of moral or mental perversion or defect: the animals in question are either idiotic, imbecile, or insane. Non-response to the influence of kindness may, no doubt, be attributed to singularities of constitution, moral, mental or physical; to eccentricity, idiosyncrasy, or individuality; but it is not the less to be regarded as a *morbid* and exceptional phenomenon.

Man's kindness to domestic or other animals in disease or health, unfortunately, even when his intention is to do good, when benefit is earnestly desired, and he makes every effort thereat in accordance with his preconceptions, is not always judicious, and therefore not always beneficial.

In the first place, it may be, and is often, *overdone*: it is injudicious in its excess. For instance—

1. The Arab or military horse may be so much made of that its sense of personal importance leads to the acquisition and display of airs, affectation, pride, or vanity of a kind, or to a degree, that may become troublesome, if not also dangerous, to man.

2. The pet dog of the luxurious boudoir is proverbially fractious and ill-natured, while it indulges sometimes also in dangerous, vicious biting.

3. Even the timid tame hare becomes impudent in attracting its master's notice, in assertion of its supposed claims on his time and attention. Jealousy, exclusiveness, or selfishness are here, as in so many other cases, the result of too much petting, too great indulgence.

Favouritism of all kinds, shown by man to his domestic pets, is in fact apt to produce the same kinds of evils as in children—to evoke jealousy, envy, covetousness—to provoke revenge, to wound feeling, to beget peremptoriness in demand or command, to produce sulkiness or surliness.

Over-petting, then, over-indulgence, apparent or intended

kindness of the type of that mentioned by Shakespeare in 'King Lear,' in which a master

> In pure kindness to his horse, buttered its hay,—

may be a *real dis-service*, may amount to virtual cruelty; while, on the other hand, true or *real kindness* may consist in firmness, severity, non-indulgence, even apparent harshness; it may require more of the *fortiter in re* than of the *suaviter in modo*, just as so frequently happens in the training of the human child.

In the wayward animal, as in the self-willed child, *chastisement* may be requisite and beneficial, provided it is rational and appropriate. But, in the hands of the passionate man, it is only too apt to be immoderate, unjust, or inappropriate. As has been pointed out in another chapter, some animals themselves distinguish between merited and unmerited punishment. Certain dogs, for instance, at once see through man's passion, cruelty, injustice, appreciating the true nature of the cause in relation to the effect; and the moral effect of such passion, cruelty, or injustice, and of punishment resulting from it, is as bad as it would be under similar circumstances in the child. Both dog and child lose confidence and respect, become sulky and revengeful, and perhaps never altogether forget or forgive the injury or affront.

To be productive of such a result as tractability, even kindness may require to be *persevering and discriminative*. That which is non-discriminating is apt to be mischievous. Thus man's, or more frequently woman's, attentions, if not cautious and judicious, lead to jealousy, rivalry, and crime among pet dogs. Hence there is always a danger of having more than one animal pet at a time.

In general terms, the treatment of the lower animals by man is to be conducted on the *same principles* as that of his fellow man, or of the child by his parent or instructor. This is the only rational system or mode of treatment, the practical application of the golden rule, regarding other animals as our fellow creatures, possibly our fellow immortals as they are our fellow mortals.

The proper treatment of subject animals requires in particular that man should be well informed of the disposition, character, and habits of the individual pupil. In other words, just as a schoolmaster, in order to the benefit of each of his pupils, must make himself acquainted with, and make due allowance or provision for, their separate and special individualities, so must the trainer or custodier of an animal which is to be a servant or a pet, in order to its greatest usefulness and happiness in either capacity, first make a study of the *individuality* of his charge. His treatment should be appropriate to the individual, and to the varying conditions or surroundings of the individual. It should both be well-timed and properly applied.

A good master should have *sympathy* with the animals in his possession or keep. He should have perfect control over his own temper, and he should possess the patience and forbearance, the good sense and good feeling requisite to make all allowance for the disadvantages under which his subject creatures labour. There should be in him a due combination of gentleness and firmness, just as in the treatment of the child. Man, as a master, behoves to be not only sympathising, compassionate, merciful, and slow to anger, but he must also be *just*; he must himself set a good *example*, for lower as well as higher animals, live

Exemplo plus quam ratione.

A *mutual understanding* must be established between master and servant, in such cases as the dog, horse, and elephant; they must be on good terms with each other, stand in amicable relationship, entertain mutual confidence and respect. Loss of temper on either side, in proportion to its frequency and severity, becomes destructive of comfort if not also of safety, in the mutual relationship, for instance, of the horse and his rider. Reciprocity of affection and attentions between man and other animals influences beneficially the character of both.

Errors of, or in, kindness on man's part there may be, and frequently are.

An *unjust supremacy* is not unfrequently bestowed by man

on the lower animals: he prefers them to his brother man in numerous instances in which he gives precedence to—

1. The objects of his superstition, as in India; or to

2. The instruments of his pleasures or profits—his race-horses or sporting dogs—

on whose dwellings, food, and drink, training and persons, he sometimes lavishes an amount of care and money that he never dreams of spending upon his fellow-man. Many a 'highly respected' wealthy landowner places his horses and dogs, his poultry, pigs, and game, before his labourers, treating the latter as if *they* were in reality the 'lower,' and the others the higher, animals. The stables and kennels, pens and preserves, of the one are, beyond any proper comparison, excellent in contrast with the ruinous hovels of the other.

Man's *superstitions* often lead to too great licence, to the mischievousness of certain species of monkeys for instance, and to the increase of certain kinds of noxious insect-vermin in the animal temples or refuges of India—the one being permitted to go unpunished, the other not being emphatically 'stamped out' as a nuisance to man. It is superstition, too, that leads, or has led, to all the absurdities connected with the *deification* of animals in all times and in all countries.

The same kind of superstitious feeling, however, which gives rise to the deification of real or imaginary animals is frequently beneficent in its tendency, if not in its actual operation, leading, for instance, to the public or general *protection* of animals that are useful to man, or ornamental to his dwellings or their surroundings, or that are both. This kind of protection, which may be careful and deliberate —as illustrated by the provision of shelter, food, nests, or nesting-places—or which may amount to simple immunity from torment, irritation, or provocation, gives rise in the animals in question to perfect fearlessness of, and confidence in, man; they obviously regard him as a friend and not an enemy, as animals in general have too much and too good reason to do.

Thus in Holland or other countries where the *white stork*

is protected by humane public feeling or sentiment, it walks the city streets fearlessly, stalking about the very market places, as I have myself frequently seen in Dutch towns; while the more valuable *eider duck* in Iceland sits on its eggs undisturbed by the presence of man. I have walked among large colonies of the said ducks sitting on or in their nests on the Island of Eidey, in the Bay of Reykjavik, stepping over and among them without causing them the least concern. In such cases as the stork, which acts as a scavenger, and the eider duck, which yields its valuable down, a sense of the animal's value or use to man may mingle with a feeling of superstitious veneration. But if it do so, it must be very far from being so influential as mere unreasoning superstition; for the sense of the dog's or horse's usefulness does not of itself, among the most highly civilised nations, give rise to the same kind of humanitarian and beneficent public feeling and practice.

The sacred ibis in Egypt and the sacred monkey in India are other familiar examples of animals protected by man's superstitions.

Dr. Leitner gives, as 'among the evidences of the high state of civilisation of the inhabitants of that Central Asian region to which he has given the name Dardistan, their love and charity to animals.'[1] If such love and charity are really or properly to be regarded as 'among the evidences of a high state of civilisation' in man, we cannot say much for the 'state of civilisation' of the leading nations of the Western World—of Western Europe at least!

It has been supposed and pointed out that man's treatment of subject animals is determined in great measure by the nature of his *food* on the one hand, and of his *religion* on the other. It is at all events a coincidence that the gentlest treatment not only of domestic, but of certain wild and even noxious animals, is, by or among the *vegetarian* Mohammedan nations or peoples of the East. The 'mild' Hindoo in his behaviour towards the sacred monkey and other animals, the Syrian shepherd in his dealings with his sheep and

[1] Nature, September 23, 1875, p. 466.

lambs, the nomad Arab in his affection for his steed, stand in strong and strange contrast to the conduct towards the horse, dog, and sheep of the *carnivorous* Christian peoples of the highly civilised West. Ample and suggestive illustrations of Mohammedan humanity to animals on the one hand, and of Christian cruelty on the other, are to be found in the 'Animal World.'

CHAPTER II.

GENERAL TREATMENT (*continued*).

THE lower animals, and especially those which man domesticates, have specific and strong *claims* on man's attention and consideration, on his sympathy, on his sense of justice; all on such grounds as the following:—

1. They are unquestionably our fellow-creatures and *fellow-mortals*. Colonel Hamley calls them, generally, our 'poor relations,' while Landseer applied the same term more specifically to monkeys. In the same sense—which is not altogether a figurative one—they are entitled to the appellation of 'brethren.'

2. It may be that they are also, as many good and great men—including eminent clergymen, from Bishop Butler to the Rev. J. G. Wood—have thought, our *fellow-immortals*.

3. They are our *servants* and *slaves*, ministering in infinite ways to our requirements.

4. They are our own or our children's *pets*, companions, or playthings; and as such are frequently simply invaluable, rescuing many a life, especially among educated and refined, but vestal, women, from *ennui* and the morbid mental conditions which spring from it.

5. They are often the *protectors* and saviours of our lives and property, displaying, in the succour of distress and the defence of a master's goods, qualities that are by no means too common in man himself.

6. They are frequently also *friends* in the truest sense; friends compared with whom Byron, and many another who has experienced the hollowness and hypocrisy of human friendship, has held man himself to be the 'lower' animal.

7. They are *prototypes*, or emblems, of man's own virtues

and vices, enjoying with him a community of moral and mental constitution.

8. Their vices are too frequently the direct or indirect product of *man's* neglect or bad usage.

9. Their *diseases*, mental as well as bodily, which resemble in their nature those of man, arise from causes that are in great measure *preventible* by him.

10. They confide in and look up to him as a *superior being*; a being of greater power, with the ability to afford protection or assistance in time of need.

11. They are both *inoffensive* and *dependent*.

They have, therefore, as Bentham, Helps, and other authors have pointed out, their decided *rights* and wrongs at man's hands, while man has a still more distinct responsibility and *duty* as regards his relation to and treatment of them. To many of them—for long and faithful service—he is under heavy debt or *obligation*.

To a certain extent, but only to a comparatively most limited extent, man has fitly exhibited his recognition of the *claims* or rights of subject animals, and of his own duty, responsibility, debt, or obligation to them. He has done so in a multitude of ways which it seems desirable to enumerate, mainly with a view to give them publicity, in order that they may be imitated on the larger scale until they become general. Man has paid public or private testimonies or *tributes of respect to animal virtues*; he has signalised their length or fidelity of service, or the peculiar character of their service; he has marked his own gratitude, *inter alia*, in the following ways, or by the following means:—

1. The provision of *refuges* or homes, retreats, asylums, for the hosts of stray, cold, homeless, hungry, destitute dogs that frequent the streets of our large cities. There is one such well-known 'home for lost dogs' at Battersea, London. There is also a 'shelter' for dogs in Philadelphia, U.S.; and there is an asylum for houseless cats at Florence; but there should be at least one such shelter, for one or more animal species, in every large town.

2. The provision of similar *asylums* for the aged and helpless, the infirm and decrepit, the old pet dogs, horses,

cats, canaries, parrots, or other animals that have so well subserved our purposes, but can do so, it is supposed, no longer.

It may be argued that the greatest kindness that can be shown to our worn-out favourites or servants is to put them to the speediest death; and an additional argument in favour of this policy or procedure is to be found in the profit that may yet be made of their skins or bones. No doubt there are cases, or circumstances, in which it may be well to take the summary measure of a painless and immediate death, rather, for instance, than subject them to inevitable cruelties and ignominy, to spin out their weary lives in suffering and sorrow. Not a few humane military men or sportsmen have had such an affection for their old chargers or hunters, that they have made express stipulations in their wills for the shooting of the said favourites immediately after their master's demise, simply to prevent the possibility of their falling into the hands of a cruel cab-driver, coachman, or groom. And it is impossible not to sympathise with the feeling which dictated such *post-mortem* arrangements.

But there is no good reason why, if it be desirable or incumbent to maintain aged men and women in comfort in their declining years, we should not do the same with certain animals whose only fault is the decrepitude of age—who have, while in the vigour of youth, been the joy of a master's or mistress's life, or who have borne the heat and burden of what is, in nine cases out of ten, a very arduous day. And there is decided advantage in establishing asylums for the old, in that it gives the veterinarian or physician due opportunity of studying the diseases of *age*, mental and bodily, the phenomena of gradual decay. Such opportunities are no trivial matter; for every addition to our knowledge of the infirmities of other animals may be turned to profitable account in our acquaintance with, and treatment of, those of man.

3. So far as I am aware there are no *orphanages* for animal foundlings, where they may be brought up by foster parents. Such institutions, among other advantages, would furnish a desirable opportunity of studying the genesis of mind and

morals, in different animal-species and genera, under different forms of education.

4. There are many cases in which wealthy philozooists have made due provision in their *wills* for the kind maintenance of their four-footed or feathered companions during the remainder of their lives. At present, however, the devising of *legacies* or *bequests* of any amount to the lower animals by way of annuity, *superannuation* allowance or otherwise, is too apt to be regarded as an evidence on the part of the benevolent donor of testamentary incapacity, in other words of morbid eccentricity or insanity. On this ground, or on other grounds equally frivolous, wills, containing such legacies, are generally contested by the relatives of the testator, by those who would, were such legacies declared invalid, become the beneficiaries; and there seems to exist a strong tendency on the part both of judges and juries, in such cases, to side with the human beneficiaries, by rendering such wills nugatory so far as concerns the animals so obviously intended to receive benefit.

A disputed case of a cat's inheritance was the subject of a well-known law plea at Vienna, in 1874, a wealthy lady having left the whole of her fortune to her pet cats, twelve in number, to their 'legitimate' offspring, and to the custodians of both the original pets and their future progeny. I have notes of a similar case that occurred in America.

While, however, the rich are in a position to make proper provision, *testamentary* or otherwise, for the life-long comfort of their pets—the poor, whose pets are quite as intelligent and amiable, quite as much esteemed as companions or friends, quite as much thought of and made of in the heyday of their youth and maturity, are not in a position to make any provision whatever to take effect after their own demise. In the case of these animal pets of the poor, there is ample room for private bequests and *charitable institutions*, to which nominations might be made, as in the case of our asylums for the indigent-old (Young).

5. *Schools* for the training of piping bullfinches and other song-birds exist in some parts of Germany. There is no reason, but the contrary, why the admirable principle and

practice of these German academies should not be extended to other animals, or why seminaries for the regular and systematic training—moral, mental, and physical—of animals which are intended in any way to be serviceable to man, should not exist in or near all our large towns.

6. Protective *legislation.* Much has been done in the form of government enactments or statutes for the public protection of certain classes of animals. But much more remains to be done, and we Britons have a great deal to learn from other nations, both ancient and modern. The earliest human laws recognised kindness to and protection of defenceless animals as man's duty; and these early laws were much more liberal, in their spirit at least, than those of modern times. The laws of Moses expressly inculcate humanity to animals. We read of an Athenian being punished for the non-exhibition of mercy to a sparrow; and of the Areopagus punishing the wanton cruelty of children.

7. The public *honours* that have been conferred on what may be called 'celebrated' animals have been of a very varied kind; including for instance—

a. *Civic* honours, such as the presentation of the freedom of the city; the bestowal of denizenship or citizenship upon a couple of dog-companions in San Francisco, an honour that has its parallel among the lower animals themselves; for instance, in the case of the street dogs of Constantinople conferring the freedom of their quarter or district for some act of signal bravery on an enemy. (Watson.)

b. Public *funerals* or burials.

c. *Monuments* in squares, streets, or cemeteries; of which one of the best known is that erected by the Baroness Burdett-Coutts, in Edinburgh, to the memory of 'Greyfriars Bobby.'

d. The presentation of *collars*, or other badges, with suitable inscriptions—one of the *ante-mortem* honours of the same well-known and much-praised animal, 'Greyfriars Bobby.' This fortunate animal indeed, or its memory, its

fidelity during life and after death to its master and its master's grave, have been honoured not only by a—

1. Monument in the shape of a drinking fountain, bearing a Latin inscription from the pen of the genial and versatile Professor Blackie, of the University of Edinburgh.
2. A collar, also with an inscription, the gift of one of the most distinguished Lord Provosts of Edinburgh, Dr. William Chambers, the head of the well-known publishing firm of W. & R. Chambers, the pioneers of cheap and good popular literature in Scotland and in Britain.
3. Photographs and engravings of itself and its monument.
4. Endless eulogies in print ('Animal World,' and Macaulay's 'Plea').
5. Exemption from the dog-tax.

Presentation collars, with the attendant ceremonials, are by no means uncommon in the case of what may be called public dogs, such as the policemen's or firemen's dogs of our large towns, or the pets of our regiments. Nor is the offering of collars as gifts for life-saving uncommon (Watson). We read, for instance, of a farmer's gratitude to his dog for saving his life being expressed in the form of (1) A collar; (2) Maintenance as an honoured pensioner during the remainder of its existence. There can be no doubt that such testimonials or presentations are much more sensible and becoming than the majority of those made by the members of mutual admiration societies in man.

e. Public *blessing* of animals by the Pope is an annual and familiar ceremony at Rome ('Animal World'); and Italy is certainly a country

in which the domestic animals have much need to be 'blessed' in more senses than one.

8. The provision of due *periodical rest* and relaxation for working animals. A *sabbath*, or day of rest, once a week, was enjoined by Scripture for all working animals; and science points to the desirability of obeying this salutary and humane injunction, both in the spirit and letter. The Sunday gambols of cart or plough horses, the result of a joyous sense of freedom from their week-day toils, must be as familiar as they ought to be suggestive. Work animals, indeed, not only require and deserve regular and occasional holidays—sabbath and others—as much as do working men, but they are likely to make a much better use of them. We know, only too well, how common it is for well-paid artisans in our large towns to devote *their* now abundant holidays to the grossest self-intoxication and debasement.

9. A common form of honouring or perpetuating the pleasant memory of an animal pet of the smaller sort, such as a dog or cat, parrot or canary, is to have recourse to the *taxidermist's* art; the animal itself is 'preserved' by means of what is popularly called 'stuffing.' In this form I have frequently seen the favourite poodle or lap-dog, reclining as was its wont, carefully preserved in a glass case in the place of honour in a master's library, or a mistress's boudoir, or in some public museum to which the 'specimen' has been presented. This is both the most prosaic and poetic form of monument, that which most vividly recalls the aspect and deeds of the departed favourite.

10. Arrangements for the *boarding out of* pet animals, either—

a. Temporarily, during the summer or holiday absences of families, or—

b. Permanently, in cases where there are objections to retaining them at home—that is, in their master's or mistress's houses—

are very much wanted. Certain animals themselves, for example the cat, have the sense to board out their young under certain circumstances; they quarter them on human families in whose tender mercies they have confidence. But

in their annual migrations to seaside or highland quarters, our city families give little care or attention to the poor cats, or other domestic animals whom they leave behind. This, indeed, is one of the common and flagrant forms of cruelty of or by neglect. There is no reason why every large town should not have its *nursery* for cats, dogs, and feathered pets, as for human infants.

11. Special or separate *cemeteries* for domestic animals may be considered an unnecessary refinement of man's humanity to subject creatures. Nor are they necessary if man does not object to give deserving animals, his old favourites and pets, honourable sepulture beside himself, in a separate partition if required of his own roomy modern cemeteries. But we are told that such things as special cemeteries exist, and their existence or establishment is to be commended and encouraged. Thus a cemetery for pet animals—horses, dogs, and cats—is to be found at Dangsten, Sussex; and it is chronicled that not long ago a votive tablet was erected in it, bearing an epitaph in blank verse 'from the pen of one of the most distinguished statesmen of the English Cabinet.'[1]

Epitaphs on the tombs of cats, dogs, and other animal pets, whether in cemeteries, or more usually in the gardens or grounds of their human proprietors, are by no means uncommon. They are various in their character—poetical or prosaic, punning, pathetic, amusing, or simply descriptive of gratitude or long service. Many epitaphs commemorative of animal virtues are to be found quoted in the 'Animal World'; and there are some with which all readers of classical English are, or are supposed to be, familiar, such as that of Byron on his dog 'Boatswain's' tomb at Newstead Abbey.

12. In elegies, odes, or sonnets of all kinds and of every degree of excellence, *poets* and versifiers have celebrated the good qualities or the good services, the heroism in life-saving or life-sacrifice, the better than human fidelity or friendship, the real nobility of character, of such animals as the dog. Cowper's addresses to his tame hares, 'Puss'

[1] 'North British Advertiser,' March 20, 1875.

and 'Tiny,' and to his spaniel, are illustrations of the testimony of the poet to animal excellence.

13. The *novelist* has done, perhaps, more than even the poet, by the frequency of his references to, and the fidelity of his descriptions of, the moral and intellectual character of certain animals, to draw man's attention to a deserving and neglected class of his fellow-creatures. Sir Walter Scott's affection for his 'Maida' and other dogs, and his descriptions of the 'Dandie Dinmont' terriers are equally well-known wherever English literature is read or studied. His 'Helvellyn,' like Greyfriars Bobby was equally honoured in life and death. The late Lord (Bulwer) Lytton graphically depicts dog-character in several of his novels; while George Eliot, George Macdonald, 'Ouida,' and several other well-known writers of different types do the same in theirs.

14. Other writers who are neither poets nor novelists have given us, sometimes in memorial *éditions de luxe*, life histories, purporting to be *autobiographies*, of favourite animal-companions. Such a volume is the autobiography of 'Fido,' a pet dog of Dr. William Chambers, formerly Lord Provost of Edinburgh, whose name has already been honourably mentioned in connection with the story of 'Greyfriars Bobby' and its honours.

15. The *painter* has not been behind either poet or novelist in his truthful delineation of animal character, making such animals as the dog, cat, monkey, horse, almost speak from the canvas. The wonderful fidelity to nature of the animal-painting of Landseer and Rosa Bonheur among living artists, and of Vandyke, Knud—'the Cat Raphael,' and others, among those of bygone ages, is familiar to all lovers and students of pictorial art.

16. Scarcely inferior to the painter is the *sculptor*, in his plastic representation of certain animals and their physiognomy; who again has invoked the aid of the *architect* in the erection of the memorial monuments of all kinds which the sculptor's art does so much to adorn.

17. The provision of *public water-troughs* for both the larger and smaller domestic animals—horses and cattle on the one hand, dogs and sheep on the other. Here, again,

Eastern humanity to the lower animals is conspicuous. In the streets of Cairo and other Eastern towns, according to Lane, such water-troughs have long existed. They are fortunately common now in our own towns, frequently as the gift of private individuals, sometimes in fit connection with memorial or monumental *fountains* for man's use; occasionally, as in London, as the result of the systematic efforts of a public association. Such public provision of an ample supply of pure water equally to man and other animals cannot be too strongly commended, or too widely imitated.

18. The public or private *distribution of food* either in the streets, squares, or other special localities of cities, in the farmyard, or on the window sill. By benevolent persons, especially ladies, whose hearts overflow sometimes with 'the milk of human kindness,' much bounty, in the form of bread-crumbs from the breakfast or dinner table exposed on the window sill, is distributed to many a large *clientèle*—for instance, of sparrows and other city birds. In certain Eastern towns we learn that charitable persons, full of sympathy for all classes of their fellow-creatures, 'may be seen daily engaged in distributing in the streets their surplus food to dogs and birds' ('Animal World').

If, as has been already shown, it be *ignorance* that is really at the root of the contempt, neglect, or cruelty that characterise man's treatment of subject animals, it is obviously the duty, and it should be the privilege, of the educated or cultivated classes to disseminate as widely and as speedily as possible among the uneducated or imperfectly educated classes a proper *knowledge of animal character*, and of the grounds on which humanity to our lower fellow-creatures is to be commended or enforced. Information of a suitable kind may be diffused, the systematic teaching of man's moral duties towards other animals may be inculcated, in a great variety of ways, including the following:—

1. In infant and other schools.
2. In school books for these and higher schools.
3. In all classes of schools between ordinary schools and universities.
4. By public lectures in all towns and villages.

5. From the pulpit, in the shape of sermons.
6. By offering public prizes for
   a. Essays; and for single
   b. Acts of kindness, or for habitual humanity, to particular kinds of animals.
7. By public meetings.
8. By animal shows of all kinds.
9. By the multiplication of societies for the prevention of cruelty and the dissemination of the principles of humane treatment.
10. By taking advantage of general literature, in the varied shape of books, periodicals, pamphlets, tracts, or other forms of publication, including:—
11. The circulation of all suitable books in all classes of *libraries*, from those of infant or Sunday schools up to those of universities or free libraries for the people.
12. The prominent exhibition of pictorial placard-mottoes at or in railway stations, market-places, stables, kennels, slaughter-houses, byres, race-courses, riding schools, and cab-stands.
13. The most extensive gratuitous circulation of attractive pictorial cards, almanacs, serials—such as the 'Animal World'—or tracts among all classes of the less educated, those classes who have more immediate charge of our domestic animals.

It is perhaps too much to expect any radical change in opinion and practice in the present generation regarding the treatment that animals have a right to expect at man's hands. Our hopes naturally centre in the rising generation, in the proper education of the young of both sexes in the *principles and practice of humanity* to animals, in the application of the grand old golden rule of Scripture to all living, sentient creatures. What our children have to learn, what they should be carefully taught, is that other animals, or at least those with whom we have most to do, think and feel as we do; are affected by the same influences, moral or physical; succumb to the same diseases, mental or bodily; are elevated or degraded in the social scale according to our treatment; may become virtuous and useful, or vicious and dangerous,

just as we are appreciative, sympathetic, kindly disposed towards them.

Whenever a child or youth learns, thinks, sees, knows, or feels all this, it will follow almost as a necessary consequence or corollary of his knowledge that he will thenceforth treat his fellow-creatures, of whatever grade, with a new and higher consideration. If he do not, there is probably some error or defect in his own moral and intellectual nature, calling for the serious attention of his parents or teachers.

By proper education of the young in the natural history of the lower animals, and especially in a knowledge and appreciation of their moral or mental character, there could not fail gradually to arise a more healthy and happy tone of *public teaching* concerning the rights and requirements of these zoologically inferior creatures, and this would infallibly in its turn lead to or culminate in a much more humane, kind, or judicious, and at the same time wise or politic, treatment. Man himself would share in the benefit in a thousand different ways, of which at present he has small, if any, conception. Not only would his own moral nature be improved, but we should hear much less of hydrophobia, and stand little in dread of it, knowing, as we then should, how rare real rabies is on the one hand, and real hydrophobia on the other, and how large a part is played, in regard to the latter most horrible of all the disorders to which poor human flesh is heir, by a morbid, or ill-regulated imagination.

There are many ways of introducing the subject of the natural history of the lower animals, as well as of man himself, into our *schools* of every grade; many modes of inculcating the principles and practice of humanity to our 'poor relations.' In the first place, there should either be special *school books*, containing only stories or statements illustrative of zoological facts, of animal sagacity and habits; or, what would be less of an innovation, such stories, anecdotes, descriptions should be introduced here and there into textbooks of the existing kind.

Among books specially adapted for the young is a series

of 'Publications for the Promotion of Kindness to Animals,' issued by Messrs. Partridge & Co., of London. The volumes are copiously illustrated by Harrison Weir, and other artists, and the authors include the well-known names of the Rev. F. O. Morris, the Rev. Prebendary Jackson, Mary Howitt, Mrs. S. C. Hall, Mrs. Bray, Shirley Hibberd, and Harland Coultas. Equally specific in its character is 'The Humanity Series of School Books'—a set of six, published by Messrs. Murby, also of London, and edited by the Rev. F. O. Morris.

But it is important that children be taught no nonsense about zoology; that their attention be rigidly confined to what is *true* and capable of verification by themselves; to *facts* of observation, or to such fair or obvious inferences from these facts as their own intellectual power enables them to think out or deduce for themselves. I urge this strongly; because I have had occasion to examine many English reading books used in the very best public academies of Scotland, including those both of Edinburgh and the provinces, and I have been alarmed and disgusted at the kind and amount of mischievous nonsense that is introduced in the form of supposed zoological fact. Hence I think that such school-books should either be drawn up or revised by our most philosophical naturalists—men like Huxley and Hooker, who do not decline the humble but important task of preparing school 'primers.' It has become obvious to me that neither do the compilers of current school-books know anything of natural history, nor do the teachers, for the latter fail to call attention to the glaring errors in question.

In short, it is an essential and inseparable part of any system of tuition of the young in zoological knowledge that the *teachers* themselves should first be taught. Notwithstanding all the certificates and grades of the present public or government educational system in this country, we have not yet produced, except here and there—*rari aves in gurgite vasto*—competent *teachers* possessed of a knowledge of even the rudiments of natural history, zoology, physiology, psychology; and until we do possess such teachers, it is hopeless to expect proper instruction of their pupils.

In the second place, much may be done in the form of

prizes, pecuniary or others, offered not only in schools, but in colleges; not only to pupils, but to teachers; prizes, in short, open for competition to all ages and both sexes. But the object of such prizes should be not a homily, sermon, or essay of the hackneyed kind, on 'humanity to animals,' based on, and consisting of, Scripture references, or quotations from theologians and poets, with comments thereon, by way of padding. Such rewards should subserve the several purposes of—

1. Developing the *observative* faculties of the young, by calling upon them to confine their illustrations of animal intelligence to what they have *themselves seen*, to describe the *mental* peculiarities, habits, eccentricities, of their own cats, dogs, canaries, parrots, and so forth.

2. Directing their attention to moral, mental, or physical sensitiveness; to the influence of education; to the mighty power of kindness; to the *higher* mental faculties—thought, reflection, generalisation—rather than to the common virtues of courage and fidelity.

3. Leading them to *experiment* on animals in a perfectly harmless and legitimate way, involving no vivisection, or even suffering of any kind; to test an animal's powers of observation, thought, inference, its capacity for progress.

4. Contrasting, in *boys and girls*, the relative powers of observation, inference, narrative, diction, or composition.

5. Creating or developing *natural history tastes* of a kind that necessitate *healthy out-door work*; establishing resources that may be of the utmost consequence in after years, as a substitute, in girls, for instance, for the trashy 'fancy work,' to which they devote so much time that, properly employed, might become, and be termed, valuable; as a substitute, in boys, for pipes, beer, billiard-rooms, theatres, and the other debasing 'enjoyments' (Heaven save the mark!) to which they too frequently devote their business leisure.

Much has been done in the way of *prize*-offering for *essays* on humanity to animals by the Baroness Burdett-Coutts, through the medium of the London 'Royal Society for the Prevention of Cruelty to Animals;' and on a greatly minor scale, by those offered to the schools of Edinburgh by

the Scottish Society of the same kind. But, judging from the published extracts from the prize essays given in the annual reports of the Edinburgh Society, I do not think that at present such prizes realise their object, for the simple reason that the stipulations, or conditions, which I have above described as desirable, have not been laid down or attended to. The offerers of the prizes seem to me to have no proper idea of the aim they would set before the competitors. 'Humanity to animals' is a very vague term; and inasmuch as *Sermons* on the subject are perhaps at once the most easily accessible, and most familiar literature on the subject, it is not surprising that the resultant essays should be virtually compilations from this ready, though not satisfactory, quarry. For clergymen, as a rule, as well as teachers, require *instruction* in natural history; indeed, there is no class of men more given to take—even in subjects quite beyond their ken, a 'preacher's licence' (which is as bad as much of the 'poet's licence,' or as many a 'sailor's yarn,' or 'village tale'), than the occupants of our pulpits; no class is more in the habit of using simile, metaphor, fable, parable, fiction; none more apt unwittingly to confound fiction with fact, dogma with inference from fact.

Some years ago I made an effort to carry out my own views anent the objects to be set before school children in prize competition for essays on 'Kindness to Animals,' in Edinburgh—a city long famed in this country for the excellence of its educational arrangements. Among others of its educational institutions, there is a whole series of schools, under the patronage of the Merchant Company, four or five large, handsome, in some cases university-like or palatial, buildings, in the city and its suburbs, accommodating about 5,000 young people of both sexes, and of all ages, from three or four up to eighteen or twenty, representing, moreover, the poorer or lower, as well as the richer, middle, and higher ranks of society, not only from every part of Scotland, but probably also of the three kingdoms. Deeming these Merchant Company Schools a suitable field for the experiment, I submitted my proposal to the Master of the Company at that time in office, a gentleman of high cul-

ture, who had distinguished himself by the prominent part he had taken in the organisation of the scholastic system in question. I would myself, if necessary, have been at the expense of a prize or prizes, and of the publication of a programme of recommendations or suggestions to competitors. In other words, I asked for no grant of funds, but simply for a field for what I regarded, and continue to regard, as an important *educational experiment*. Unfortunately, however, my proposal was not entertained.

I mention this little piece of experience for the purpose of urging others, with more time, means, and authority to support their benevolent and enlightened projects, to make efforts of a similar kind in other quarters. Undoubtedly, somehow or other, sooner or later, success will attend them; and not only so, but what is at present unknown or exceptional will by-and-by, I believe, be the common practice of public schools, including those of the Merchant Company of Edinburgh.

In 1876, the professor of Moral and Metaphysical Philosophy in the University of Oxford, H. W. Chandler, M.A., of Pembroke College, delivered a series of academical *lectures* on 'The Duties of Men as regards Animals.' This is an example worthy of all imitation in other universities. But there is no less reason why such a subject should be selected for discourse or exposition before more popular and larger audiences, before those crowds of intelligent persons of the middle and artizan classes that crowd the lecture halls of our mechanics institutes, athenæums, people's colleges, and similar establishments every winter. Such a subject only requires to be introduced to become popular; it admits of pictorial and anecdotal illustration; and there can be little doubt that a few years hence 'animal character,' and 'man's duty to his poor relations,' will become types of the kind of subject that will supplant much of the historical or biographical matter that has become in such arenas so flat and stale, if not also unprofitable.

Nor does the *Pulpit* duly fulfil its duties in relation to the dissemination of a feeling of humanity to the lower animals. No doubt sermons on the subject have been preached by

Dr. Chalmers and other eminent divines, some of whom, such as Dean Stanley, the Rev. J. G. Wood, the Rev. F. O. Morris, and the Rev. Prebendary Jackson, have also published interesting works well calculated to produce such a feeling, or state of public sentiment. But the clergy as a whole do not realise—or if they do, certainly do not perform—duties that would come so appropriately from clergymen, by the delivery of discourses that would be so suitable to the pulpit. Their failings in this respect have been most properly and most temperately pointed out by Sir James Coxe and other competent critics of the present dogmatic and polemical, non-convincing and non-converting, character of our church oratory.

There is still a most promising field for the exertions, there is much room for an extension of the operations, of all kinds of *Societies for the prevention of cruelty to animals*; much remains to be done by them, in some of the ways already pointed out, in the dissemination, in all our great centres of civilisation, of a knowledge of animal character, capacities, habits, and requirements. What has already been done in this and other ways in the *diffusion of information* of a desirable kind, and what may still further be accomplished, may be found pointed out in the interesting pages of the 'Animal World.'

It is much to be desired that the branches of such a society as the London 'Royal Society for the Prevention of Cruelty to Animals' should be spread all over the three kingdoms, as well as throughout our colonies; or that some equivalent societies, similar in their aims and operations, should be established in lieu of such multiplication of branches. Remembering, however, that union is strength, and the advantages of co-operation, more is perhaps to be expected from the extended and extensive operations of a single influential society with widely-spread local branches, than from a host of minor societies having different names, objects, and interests.

CHAPTER III.

CURABILITY AND TREATMENT OF ANIMAL INSANITY.

In general terms it may be said that animal insanity is *curable* or incurable, under the same circumstances as is that of man; that is to say, that *acute* cases of short duration, or in their early stages, are, as a rule, curable, while in confirmed cases the chances of recovery diminish with the duration of the mental disorder. In other words, the treatment of insanity in other animals, as in man, as was long ago explained by Pierquin, is hopeful in proportion to its acuteness or recentness. Thus, as in man, *acute ephemeral mania* is the most readily curable form of insanity, so much so that in a sense it cures itself—the natural tendency being towards *spontaneous recovery* if the animal is simply let alone. Were this fact borne in mind, understood, or realised by drovers of cattle, there would be no injudicious pursuit of so-called crazed or infuriated cattle in our city streets; no striking of them when overtaken and brought to bay. In such cases it is man himself, who by the absurdity of his conduct produces, maintains, or exaggerates in the animal the very condition which he so much dreads, viz. the development of furiosity of a maniacal type.

Curability then is in proportion to *acuteness*, which again implies *recentness* of attack. In cases where insanity depends upon, or is determined by, lesions of the senses, such as sight or hearing, or by organic disease of the brain or its membranes, the curability of the mental disorder will obviously depend on the curability or removability of its physical cause.

Animal insanity is in great measure curable: a statement having an important practical bearing on the public dread

of rabies, which, according to the majority of veterinarians, is virtually incurable. These two facts—the curability of insanity and the incurability of rabies—have to be considered in relation to this third fact, the comparative frequency of insanity and infrequency of rabies.

Recovery sometimes occurs from ordinary forms of insanity when unlooked for, even, for instance, when the disorder appears to have become chronic, confirmed, or permanent: a circumstance of importance in stimulating all efforts at cure, and in giving ground for hopefulness as to the result. Thus Gall gives an instance of sudden recovery in a bitch from melancholia of two years' duration. Pierquin records instances of recovery from mental imbecility marked by inability to learn. But it is just possible these may have been cases simply of improvement with age, or by kind treatment, to the extent of docility, or capacity for education.

It is important to distinguish between *cure* and recovery. The former implies efforts on the part of man and the success of his efforts; while the term *recovery* does not necessarily involve man's agency at all. Recovery is the natural tendency of mania and other forms of insanity. Man may assist recovery, or may hasten it, by judicious protection or treatment. But it will also take place spontaneously—perhaps in the majority of cases—if the animal is simply left to itself. The very different results of meddlesome interference on the one hand, and of simple non-interference on the other, is most frequently seen in the case of cattle that suddenly become maniacal while being driven to the shambles through the streets of our large cities.

Animal insanity is, therefore, by no means incurable, as a rule, though certain forms of it are so. When it has become incurable, where recovery is hopeless, the reason has frequently or generally been, either that no treatment was attempted, or that the treatment attempted was improper. It is quite as important to realise the incurability of certain forms, as the curability of certain other forms of mental or moral defect, peculiarity, or disorder.

Congenital mental *defect* belongs necessarily to the *incurable* category, though, just as in man, amelioration is

possible under judicious treatment. The incurability or incorrigibility of certain ineradicable bad habits, of certain forms of vice or viciousness, of stupidity or temper, in such animals as the horse and dog, if only realised by their masters or custodians, would convince them of the equal futility of severity or kindness, punishment or menace.

The treatment of animal insanity is to be conducted on the same general *principles* as that of man, the principles, to wit, of common sense and of kindness. The first most obvious step to be taken is to remove the cause, if discoverable, of the mental disturbance; and this of itself is frequently sufficient to effect a cure, to lead to recovery. For instance, in the case of animals restrained by the nature of their artificial life from the natural gratification of the sexual passion, and in whom melancholia, or other forms of insanity, have directly resulted—restoration to freedom of life, to liberty of action, to the society of their species, may at once bring about recovery. There are again various forms of secondary or sympathetic insanity depending, for instance, on the presence of worms in the intestines, or of poisonous and irritant foreign bodies in the stomach, in which cure is brought about by simple emesis or catharsis—vomiting or purging—artificially produced by drugs. In mad bulls, whose madness is the result of, or consists in, sexual excitement of a kind or degree that renders the animal vicious and unmanageable—recovery, usefulness, and safety are procured by means of the operation of *castration*.

Sometimes it happens that while the diseased condition which produced the insanity is removed, the mental disorder is left behind as a permanent and serious sequela—more serious perhaps than the cause which gave it origin. Such was the case in a horse of Franconi's, mentioned by Pierquin, who also gives an instance in a cat, showing that the mere removal of the cause is not always sufficient to remove also the consequent mental disturbance.

Where this is the case, when the insanity becomes somewhat permanent, various modes of treatment may be had recourse to—moral, mental, physical, hygienic, dietetic, surgical, medical, or medicinal.

Moral means are sometimes quite sufficient and efficient, as in the case of a cat restored to its mistress's favour, mentioned by Pierquin. The important influence of *kindness* in the treatment, however otherwise varied, of almost every form of insanity, illustrates forcibly the utility and success of moral measures, e.g., in the mania of the cow and horse. Indeed, it may become important above or in addition to all other measures of whatever kind, or it may prove a satisfactory substitute for them.

Kindness should be applied by man in order to the development of confidence and attachment on the part of the animal patient. It is a remedy that is equally applicable, in one form or other, to the treatment of all morbid states, whether of mind or body.

Fears are sometimes, in their early stages, easily calmed, for instance by a master's voice; whereas if unattended to, they are only too apt to pass into mania on the one hand, or melancholia on the other, with or without delusions. Even in the abject terror of rabies, confidence or re-assurance is frequently at once produced by the soothing sounds of a kind master's voice.

In certain cases in the horse, as in man, change of *air* and scene, involving travel, and novelty of residence, associates, associations and guardians, is often efficacious (Pierquin), consisting as it does of conjoint moral and physical treatment.

Air, moreover, acts as a natural calmative to the mental excitement of bees in swarming.

In other cases, as has already been shown, *drugs* and drugging are indicated, for instance, in insanity from intestinal worms, when purgatives at once effect a cure. In such a case there is an intelligible, demonstrable, single cause; and the cure, with its *modus operandi*, is equally intelligible, demonstrable, and direct.

Purgative treatment, therefore, is always desirable to begin with; for instance, when a dog is suspected of (1) rabies; (2) cerebral disease; or (3) permanent organic paralysis; inasmuch as the alarming symptoms or phenomena,

motor or mental, may thus be proved to be merely functional, temporary, and removable.

In other cases again, the use or application of tartar emetic as a calmative or depressant; of narcotics or other calmatives; of counter-irritation by cauterisation or blisters; and of the trephine, the latter in traumatic cases, has been advocated, but, it must be added, mainly by authors belonging to the 'old school.'

Nowadays, *prevention* ought to be regarded as better than cure, and protection as more important than drugging.

Animal insanity may be practically divided into that which is—

1. *Natural*, and presumably non-preventible; and that which is—

2. *Artificial*, and therefore as certainly preventible.

The latter category, again, includes cases in which—

a. Insanity has been intentionally or deliberately produced by man—for instance, by narcotics or otherwise—for the purposes of experimental study; as well as those in which—

b. It results, unintentionally or accidentally, from man's ill-usage in some of its varied forms.

In all cases of active treatment, *time*, as an element in recovery, must always be kept in mind.

Thus the artificial insanity, produced in horses by fraudulent purchasers, by poisons of the narcotic class is, as a rule, detectable by time, along with isolation, observation, and the prevention of tampering (Pierquin).

The importance of simple *isolation and quiet*, as the obvious rational plan of treatment, is conspicuous in the case of ephemeral insanity, of momentary or passing morbid impulse, of transitory furiosity or mania. In relation to such cases the adage holds especially good, that 'time tries all.' Had man only patience and common sense in such cases, a correct diagnosis would be formed, and there would be no ground for public dread—the fruit of public ignorance.

All the foregoing remarks are obviously condemnatory of the present unjust and barbarous, impolitic and absurd treatment of animal insanity by man—of the poleaxe, shooting,

or poison. In every respect such rash treatment is erroneous: for a little patience, a little trouble, a little common sense or reflection, a little sympathy or humanity, would serve to convince the owners or custodians of valuable animals, such as horses and cattle, that what appears to be the most dangerous and most hopeless of all forms of animal disorder or disease—the dreaded 'madness'—is really one of the most curable, hopeful, and innocuous—under proper management, be it always understood.

Pierquin points out the wholesale poisoning of dogs that in his day took place in Prussia and France, not only of animals under suspicion of rabies, but simply as a preventive measure, to forestall the possible future development of the dreaded disease. These slaughtered innocents were the victims of popular alarm and ignorance, of a mere possibility, of a contingency that might never happen. Watson, on the other hand, calls attention to the summary shooting of horses for ferocity of temper and all sorts of vices, real, alleged, or supposed.

Such a summary disposal of suspected or affected animals is attended with many serious disadvantages, including the following:—

1. No opportunity is allowed for recovery; the result of which is the loss of large numbers of valuable animals, especially horses, cattle, and dogs.

2. No opportunity is afforded, subsequent to its origin or development, for the study of animal insanity, and the diseases with which it is apt to be confounded. The result of this is gross ignorance of the natural history of the diseases in question; which ignorance again produces the serious errors in treatment that have already been adverted to.

There is much need of a *rational* treatment, not of insanity only, but of many conditions of the senses or of the mind, of the temper, propensities, passions, or appetites, that constitute technically, among veterinarians, 'vices'—such as blindness, nervousness, shying, timidity, alarm, stupidity, biting.

During the reign of human and animal demonology, the cruel treatment resulting from unjust suspicion and mischievous superstition on the part of man was directly

provocative of the most furious forms of insanity. But such absurdities of treatment were not confined to the middle ages. They are quite as common and quite as mischievous in our own country at the present day, in the form, for instance, of the 'hue and cry' of the city populace after some poor bewildered and belaboured, frightened and fugitive, dog or ox.

As a general rule, it may be asserted that the *same kind of treatment* will produce the same kind of results in the insanity of other animals as in that of man. And it is an important practical fact that the treatment suitable for insanity is *pro tanto* also proper for rabies and other diseases with which insanity is so frequently confounded, some of which are more serious than insanity itself. For both classes of cases, the following procedure is plainly indicated:—

1. *Isolation*, in some cases with modified light, or in the dark; solitary confinement, so that harm to other animals, as to man, may become a physical impossibility.

2. Close *observation*, especially in the early stages, or in suspected or doubtful cases, with patient waiting for the development of symptoms of a kind that will determine the diagnosis.

3. Perfect *tranquillity*.

4. The *removal* of all *causes* of mental or physical excitement; for instance, of terror, in the form of disturbing sights and sounds, persons or things.

5. Proper *nursing*, housing, food, and drink, including temperature, or warmth.

6. Such *medical*, medicinal, or surgical treatment as may be necessary, including the judicious use of *drugs*.

There is the same danger in other animals, as in man, however, of *overdoing* medical or surgical treatment. There is such a thing as *meddlesome* or mischievous medicine and surgery. The ease and rapidity with which animals frequently or usually recover from serious illnesses or wounds, when placed in favourable circumstances, afford strong presumptive evidence of the value of what is called the *expectant* treatment, both in medicine and surgery; that is, the patient watching of nature, aiding her by following her indications

in the form of judicious nursing, the supply of proper diet and warmth, and protection from all sources of physical or mental disturbance.

In other animals, as in man, the evils or errors of fussy nursing, or of continuous attentions, soon become patent. The slightest disturbance sometimes of animals that have recently become mothers, leads them not only to desert their nests or young, but even to devour the latter. In such cases the very simple and sensible treatment is to leave the poor animals alone, to 'let well alone.'

Among other advantages of *solitary confinement* of the animals, with patience and observation on the part of man, in such cases as madness, suspected or reputed, would be the important discovery—

a. That many reputedly rabid or rabietic dogs labour really under temporary forms of ordinary insanity, or of mere transient and removable mental excitement; and

b. That such animals are quite harmless if properly dealt with, speedily recovering composure and good-temper under the genial influences of quiet and kindness, of good feeding, and other attentions to their creature comforts.

And the result of such a discovery would be the salvation of much valuable dog life on the one hand, and the prevention of, or recovery from, many cases of human hydrophobia on the other. The innocuity of most cases of reputed madness in dogs, and the equal injustice, impolicy, and absurdity of destroying animals merely suspected of rabies, cannot be too soon or too fully made public, especially in districts where hydrophobia is, or is said to be, prevalent in man.

In a case of panphobia in a cavalry horse, cited by Pierquin, the animal regained calmness and confidence on becoming *free*: a circumstance that points to the propriety or importance, in certain cases at least, on the one hand, of not tethering, or confining, and on the other of inspiring *confidence*, or of making all due attempts thereat, in the treatment of those forms of insanity in which morbid *fear* is a characteristic. For instance, in cases of fire in stables,

menageries, the feeling of captive helplessness, to the terror of the stalled or tethered horses or the caged animals, and to the physical influence or glare, very literally 'madden' the poor brutes, letting them free, sending them away from the h gave it birth, panic would gradually subside.

s a remedial means, is not utilised, at least to of which it is capable, whether in the treatment of the various forms of insanity, of the various degrees of excitement, irritability, anger, fury, or of depression, grief, despondency, despair; and there can be no doubt of both its calmative and stimulant effects under different circumstances. Any kind, or all kinds of music may act as a calmative, soothing the 'savage breast' of other animals, as they do that of man; or certain musical notes, or sorts thereof, may bring about a perfect calm, as certainly as others do a dangerous fury.

The soothing effect may be immediate, and extraordinary; more usually it is gradual, though decided. The effects of music as a *modus medendi* in other animals are analogous to those that result from its use in man. In our domestic sick rooms, in our hospitals, both for insane and sane, music is constantly being rendered useful in inducing sleep, calming excitement, developing pleasurable feelings. For upwards of twenty years, I have myself had occasion to employ it largely, in various forms, as a medicine partly psychical, partly physical—including public, and domestic or chamber, practice, in concerts, balls, classes for vocal music, rehearsals, or otherwise—in the moral treatment of the inmates of the Murray Royal Institution, a hospital for the insane of the higher classes, near Perth; and my experience there led me, many years ago, to recommend its similar adoption in general hospitals for the sane, and especially in their convalescent departments.

As a *soothing* agent music frequently becomes in man's hands a means of bringing about submissiveness and innocuity in obstreperous animals (Pierquin); or it enables him to capture them for his various purposes. As a *stimulant*, it cheers and encourages to work and to perseverance therein.

'There can be no doubt that the serpent-charmers (of the East) . . . . . possess the power of soothing and taming the snakes, so as to render them harmless to themselves,' by means of the 'shrill sounds of the flute' (Houghton). In India a special class of musicians are sent for by the tenants of houses infested by snakes. These 'snake-charmers,' properly so-called, lure the dangerous serpents from their hiding-places, produce in them a pleasant humour, in which they become indisposed for the moment to use their poisonous fangs, and even allow themselves to be handled with impu nity. Here the very practical and important result of the power of music, in the capture and subsequent destruction of highly poisonous animals, becomes obvious.

The old familiar drum or trumpet call stimulates and revives the youthful spirit of the old military horse. Singing or piping to cheer the spirits and quicken the action of their flocks and herds, has, from time immemorial been, and still is, a common practice among Eastern shepherds.

In abstinence from food, even when it leads to death by self-starvation, it does not appear that veterinarians resort to the means used by man in similar circumstances in human insanity—to the use, that is, of any form of artificial alimentation.

I quite agree with Pierquin in thinking it most desirable and becoming that all forms of animal insanity should be studied and treated in proper animal *hospitals*. There can be no doubt that regular hospital treatment, similar to that which is now bestowed in all civilised countries on the human insane, would save much valuable life, both of man and other animals, less directly than indirectly, perhaps, by the improvement of our knowledge of the phenomena of animal insanity, and by conviction of our errors, ignorance, and prejudices. A due knowledge of the facts and phenomena of causation and curability of animal insanity must obviously underlie, as a basis, all systems of treatment. What is specially desirable at present on the part of man is *knowledge*, and on that of animals *protection* by and from man. It is ignorance, for instance, that leads to those futile and mischievous attempts at the cure of bad tempers or ill-nature—the fruit of cerebral dis-

[illegible]-attempts that are frequently one of the worst [illegible] man's ill-usage or cruelty.

[illegible]ent there is not, so far as I am aware, a single [illegible] any part of the world that either devotes itself or one [illegible] epartments to the treatment of the *mental* diseases [illegible]wer animals, or indeed that recognises in them [illegible] all. For the ordinary bodily ailments to which [illegible] animals are liable there are here and there well-appointed public hospitals or infirmaries; for instance, those attached to the veterinary schools of France and Germany. In our own country there is only one such hospital, and it is of recent establishment—the Brown Institution, London, which, however, is doing excellent scientific work of an experimental character, under the auspices of Prof. Burdon Sanderson and Dr. Klein. There is also in London a canine hospital, of a private character, however, and on a most limited scale. In Paris there are canine hospitals or infirmaries, according to Fleming, and he thinks that *canine* infirmaries should be attached to or connected with all veterinary schools, wherever situate. But there is equal argument, surely, in favour of equine, feline, and bovine infirmaries, as well as of separate hospitals for poultry and cage birds.

Much more appears to have been done in supplying the lower animals with hospital succour and shelter, in age, accident, injury, infirmity, sickness, disease, by Eastern nations in former times than by Western nations of late years. Thus there were hospitals for cats, dogs, monkeys, horses, or other animals in India, Egypt, China, and Turkey. In Ahmedabad, the capital of Gujerat, there were in 1839 no less than three hospitals where sick and lame monkeys were cherished. Some, at least, of these Eastern establishments, however, were not infirmaries for the treatment of disease so much as mere *homes* for the maintenance of a certain number and variety of animals. Thus the monkey temple at Benares, which still exists, and which was visited by the Prince of Wales in 1875, is said to 'be remarkable for a whole colony of Durga monkeys, which are held most sacred by the Hindoos, and which are maintained

by the offerings of the visitors, who always bring a supply of parched peas and sweetmeats to feed them with.'[1] Nor was the general philanthropy that dictated the foundation, endowment, and support of such institutions sufficiently discriminative. It admits of doubt, for instance, whether it was prudent or proper, in what was apparently a regular vermin ward or department of the animal hospital at Surat, to maintain such noxious insects as bugs, fleas, and lice, by the provision of human mendicants, male and female, as food supplies for them!

There can be no doubt that public provision for sick and disabled animals, and especially for those which are the useful servants of man, is not what it ought to be, even in the most highly civilised countries. Hospitals furnished with all proper appliances for their medical and surgical treatment, possessed of convalescent accommodation and ample exercise ground, are required in all our large cities or centres of population. And such hospitals should include wards or departments for the observation or study, on the one hand, and the treatment, on the other, of all animals specially dangerous to man; for instance, of those reputedly mad or insane; that have been convicted of serious biting, kicking, worrying, or assault; or that have otherwise been the cause of accidents to man. Special attention should be given to *morbid mental* phenomena. Every veterinary school should have its properly-equipped hospital for the study and treatment of all forms of disease, mental as well as bodily, in all species and genera of at least the ordinary domestic animals, such as the horse, dog, cat, and ox. In our largest cities, moreover, such as London, Paris, Berlin, Vienna, and New York, there should be hospitals of a public, metropolitan, or national character for *particular species* of domestic animals, such as the horse, dog, cat, ox, song birds, and poultry.

Proper maternity hospitals, again, for the larger and more important of our domestic animals, would not only provide homes for suffering mothers at a critical period in their lives, would not only save many mothers and even more offspring, but would enable us to study thoroughly the disorders of

[1] 'Graphic,' January 5, 1876, p. 123.

d parturition in different species and genera.
, or at least homes, are not altogether unknown.
or instance, that '*kennels* are often provided in
rkey for homeless female dogs, in which they
h and nurture their little ones, and frequently
by humane persons to provide these necessary
as well as food for them' ('Animal World').

Even animal *reformatories*, if not *prisons*, should not be considered altogether Utopian, when it is remembered how many offences animals commit which need not be committed; which, in other words, are *corrigible* by systematic treatment, as they have been produced simply and solely by man's maltreatment. There are numerous troublesome or dangerous vices of valuable animals, such as the horse and dog, that may be eradicated by patience and perseverance, in alliance with sympathy and kindness.

Attached to every zoological garden and menagerie also there should be a *sanatorium* for the sick. But, in point of fact, our zoological gardens and menageries, so far from possessing or being hospitals for the cure of disease, are establishments for its production. Captivity in a limited space, with artificial temperature in many cases, and unnatural artificial life in all, contribute to the production of a series of disorders, both of mind and body. The insanitary conditions of such establishments include:—

1. Uncleanliness of the cages or dens.
2. Imperfect aëration or ventilation.
3. Scarcity of clean running water for bathing.
4. Want of exercise, or of gymnastics, which would be an artificial substitute.
5. Overcrowding in a limited area.
6. Imperfect drainage.
7. Imperfect or artificial light.

The scrofula or tubercular disease, so fatal to monkeys in all zoological gardens and menageries, is pre-eminently an *artificial* product, and perhaps not less so is the paraplegia to which captive carnivora are so liable.

Among the recommendations made by Miss Buist for the treatment of an invalid cage bird, she suggests that it

should be afforded as much *amusement* as possible 'by hanging its cage where it sees people passing, and hears plenty of noise and bustle.' She advises also *change* of air and scene; for instance, the use of a new cage in a strange room. These sensible recommendations, the principle of which is obviously directed in the first place, towards the psychical condition of the patient, acknowledge the great importance of variety, change, novelty, amusement; the necessity of breaking up monotony or sameness of life, and of gratifying the natural love of *society*, of their own species as well as of man.

Change of treatment—including change of the person who treats—is frequently desirable, at least as an experiment; for instance, in the case of the grooms of horses where harshness or bad usage is suspected. The results are sometimes as important as they are remarkable, as regards the corresponding change of character and habits in the animal. So simple an expedient is often sufficient to bring about a radical reform of what were supposed to be ineradicable vices: to convert a dangerous and useless animal into a valuable and useful one. The value of even a change of dress, in the attendant upon a shying horse, is remarked upon by Pierquin. In such cases, where the animal associates a particular dress with a particular person, and both dress and person with well-remembered cruelties; or where the mere change of dress causes the unobservant animal to mistake a groom's identity, this difference in apparel may make a wonderful difference in an animal's temper and tractability.

An immense amount of mischief is done to horses by the irrational, erroneous, usually secret treatment of grooms, who are not necessarily cruel, who may not dream of inflicting cruelty, but who are, nevertheless, possessed of the idea, as so many schoolmasters are, that *corporal punishment* is the proper corrective of bad habits of all kinds; and who, moreover, frequently themselves lazy, tipsy and irascible, inflict, sometimes systematically and for long periods, punishment that is unmerited, indiscriminate, inordinately severe. The result of such treatment is too apt to be a thorough upset of the nervous system of the poor

horse which is perhaps ruined for its master's use. An argument, this, for masters looking *personally* to the comforts and good treatment of their horses, dogs, and cattle, and for not delegating a trust so liable to abuse to underlings of any kind

Fortunately the same general, and even to a certain extent, the same special treatment is applicable to other morbid conditions than insanity. It is *pro tanto* suitable in the case of—

1. Rabies, distemper, and many other bodily diseases; as well as of—

2. Many vices, such as shying, bolting, restiveness, morbid timidity, and the physical conditions on which these disabilities so frequently depend; and, moreover, it is desirable in the case of—

3. Animals merely *suspected* to be labouring under this or that disease, mental or bodily, or under the prodromata thereof, for instance of animals reputedly mad or rabietic.

Animals themselves treat mental defects in their offspring very much as man does, showing on the one hand the same tenderness and thoughtfulness; and on the other, committing the same kind of mistakes. Thus, the bitch that recognises mental imbecility in her pup, sometimes gives it special attention by providing for its wants in the most considerate, loving, self-sacrificing way. But, on the other hand, simpletons among young foxes are apt to meet with treatment of an opposite, harsh, and injudicious kind, though not the result of any intended cruelty. The object of the parents is obviously to sharpen the dull wits of their stupid cubs, an object which, by reason of mental defect, it is impossible to accomplish. But the same sort of *error* is common to man, to parents and teachers alike, in the attempted education of the incorrigible dullard, whose incapability or incapacity arises from the same cause as the stupidity of the mentally imbecile fox-cubs—*congenital and permanent mental defect.*

CHAPTER IV.

PUNISHMENT BY MAN.

THE history of the punishments inflicted by man on the lower animals possesses many features of great interest.

In the first place, assuming apparently the *moral responsibility* of certain animals, their equal culpability with man for the same kinds of offence or crime, they have been put through the same forms of *public trial*, and subjected to the same forms of public punishment. More especially was this the case in the earliest ages—in scriptural days, in classical times, those connected with the history of ancient Greece and Rome in the climax of their prosperity, and in the Middle Ages. But though such trials are seldom or never now heard of, such punishments are by no means unknown, even in our own times, and in our own country. The old Mosaic Law (as set forth in Genesis, ix. 5, and Exodus, xxi. 28) provides for the equal punishment, on the ground of equal responsibility, of certain animals with man. Thus, the ox that killed a man was liable to death-punishment, 'just as if it had been a man who had murdered any of his fellows' (Wood). An ox was accused of *homicide* by Moses; a goat and ass were condemned to burning, as recorded in Leviticus. The primitive *laws* of Moses, of the ancient Hebrews, were followed by similar jurisprudence or legislation in ancient Athens and Rome. The Greeks and Romans of the classical era had regular legal procedure concerning, passed formal judgments upon animal offences, real and supposed—procedure that has been described by Democritus, Domitian, and other classical writers. The well-known laws of Draco and Lycurgus made provision for the formal and public trial of *animal criminals*. In Athens a special court, called the Prytanæum, was established for the hearing of law-suits to

which animals or their offences gave rise. The ingratitude of the lion was punished. The ox was regarded as man's fellow-workman and equal, as deserving similar blame and similar respect, according to circumstances.

In the Middle Ages, especially in France, in or about the fifteenth century, the judicial punishments of the lower animals, as described by Pierquin, were both frequent and singular. In some cases there was formal arrest of the animal-culprit—or a formal summons to court—followed by accusation, conviction, condemnation, and execution of the sentence; the whole judicial proceedings being held in the same *courts* and guided by the same legal authorities as were the criminal trials of man. There was regular pleading and defence, an official advocate being appointed, from a whimsical sense of justice, by the court on behalf of the accused animal. It was his duty to defend the prisoner at the bar. But while we hear of many convictions, we have not been made aware of any acquittals. Indeed it is to be feared that condemnation was a foregone conclusion, and the whole proceedings a judicial farce.

Nor was the farce confined to legal courts. Quite as frequently animal criminality came for trial and condemnation before *ecclesiastical* courts, so that, while the legal courts pronounced sentence of death by the gibbet, the ecclesiastical courts fulminated their anathemas and issued their letters of excommunication or proscription, uttered their imprecations, or merely and mildly administered censure. Both classes of courts had their laws and ordinances specially applicable to animal crimes and criminals; both issued their edicts with all the pomp and usage of the day proper to human trials.

The animals accused and punished, the crimes of which they were accused, and the forms of punishment administered, were alike curiously varied. The animals included the bull, cow, dog, cat, horse, swine, rabbits, geese, cocks, pigeons, and even caterpillars. The offences with which they were charged were usually the causing fatal injury or accident to man, endangering his personal safety, destroying his property, or disobedience and insubordination. In France, a cock was charged with and punished for sedition. Bulls,

cows, and dogs were suspended on the public gibbet by the public hangman. Caterpillars when they became troublesome were declared accursed, and were solemnly excommunicated.

In what is now complacently designated a superstitious age,' at a time when a belief in witchcraft and diabolic art was rife, and was consigning innocent old women to the stake or to the mill-pond, it is not surprising that innocent animals should have been cruelly punished for purely imaginary offences. Black cats and horses, black animals in general, and perhaps in proportion to their mere blackness, were supposed to be possessed by, or instruments of, or connected in some way with, the devil; and short and sharp was their shrift accordingly. A cock was accused of, and condemned to, death by burning, for having—it was said or supposed—laid an egg: a phenomenon that was so obviously out of the ordinary course of nature, that it was ascribed to the agency of the supernatural, to witchcraft, or satanic influence. Bees were condemned to death by burning for various crimes, such probably as stinging a child or a man. Houzeau mentions the judicial punishment of a horse for supposed magic, which was really only a sort of dancing, or other eccentric motor phenomenon in the animal.

Capital punishment was inflicted for various forms of theft —as it was for sheep-stealing by dogs in our own country in comparatively recent times. 'Yarrow,' for instance, was tried, condemned, and executed as *particeps criminis* with its master in sheep-stealing. Swine, rabbits, pigeons, geese were proscribed *en masse* or individually, while letters of *excommunication* were issued against caterpillars and field mice; or caterpillars, when they became a nuisance, were declared accursed, as well as solemnly excommunicated. In times of public calamity, when human life was destroyed in a wholesale way—probably as the natural penalty of some of man's transgressions of physiological or sanitary law—casting about for a cause of calamity, and it may have been also for some sort or measure of propitiatory sacrifice, an ignorant, superstitious, priest-ridden populace has been too apt to find vent for its distress by sacrificing the harmless domestic ani-

mals that might otherwise have continued to minister to man's comforts.

Let us pause, however, before we congratulate ourselves that these days of superstitious ignorance have gone by—that such sacrifices of devil-possessed cats or dogs are things of the past, characteristics of the 'dark' ages. In England so lately as 1829, it is stated that there was a trial by jury of a horse that had been the cause of a fatal accident to its master. The trial of 'Yarrow' and its master in Scotland, as described or referred to by Sir Walter Scott and the Ettrick Shepherd, must have happened about the same time, and one of the notes to 'Waverley' relates to the trial of a cow for ale-tippling and tipsiness.

So lately as November, 1876, only two months subsequent to one of the congresses in that city of the 'British Association for the Promotion of Science'—a congress that had, however, in its discussion on 'Spiritualism,' exposed to public view the morbid credulity even of men of undoubted scientific attainments—Glasgow, collegiate and wealthy, that prides itself on being the second city of the British Empire, by means of its police massacred no less than 1,200 dogs. And for what reason? Because it was feared that some of these poor animals might become rabid; that if they became rabid they would bite man; that if man were so bitten he would inevitably be affected with hydrophobia; and that hydrophobia is a certainly fatal and horrible disease. The immediate cause of the slaughter was the fact that three men had died of so-called 'hydrophobia' in the Royal Infirmary of Glasgow, within a period of a few weeks.

But the popular panic was based on a series of *false assumptions*, and therefore of false fears. For rabies is rare in the dog, at least in Scotland, so much so that very few practitioners, veterinary or medical, ever saw a genuine case; hydrophobia in man is equally rare there; and both in Scotland, and elsewhere, when hydrophobia does occur in man there is seldom proof of the rabidity of the dog that bit, or that was supposed to have bitten, the patient. The peculiar phenomena of the disease are, in the majority of cases at

least, ascribable to *morbid imagination*.[1] In sh[illegible] and cry of 'mad dog' is as little rational as [illegible] diabolic possession; and the wholesale massacre [illegible] animals, on the ground of mere possibilities of b[illegible] by this or that disorder, is as cruel and indefen[illegible] one case as in the other.

It has already been stated that in the [illegible] ages the excitement or passion of the persecuted cat or dog was ascribed to diabolic possession, just as the epilepsy or mania of man was attributed to satanic or demoniac agency. And the treatment was in accordance with the popular belief. But it is doubtful whether, in these dark ages, there was any such ruthless sacrifice to man's stupidity or morbid fears as the massacre of the dogs of Glasgow by its magistrates in the winter of 1876.

Various animals then are or have been punished by man—

1. For their own offences.
2. For possible or supposed offences.
3. For offences to which they were urged and for which they were specially trained—by man.

The latter category includes the punishments inflicted on sheep-stealing dogs and of other dog-accomplices of man in the various forms of theft.

In order to be serviceable or salutary as a deterrent or corrective, punishment of other animals by man must be judicious. It ought to be—

1. Well-timed.
2. Proportioned to the
   a. Nature of the offence.
   b. Age and character of the animal.
   c. Special circumstances of provocation or otherwise:

while man himself should ever—

3. Maintain his own temper or composure, and possess a strict sense of justice.

In order that the *idea* of punishment or penalty may be associated with that of offence in the dog, cat, or other animals, it is desirable that they should be, if possible, caught

[1] I have elsewhere specially discussed this subject. *Vide* 'Bibliography' No. lxxxii.

in the act, *in flagrante delicto*, and punished on the spot, in view of the proofs of the offence.

Man frequently commits the error of exercising *undue* rigour or *severity* in his punishments—of not adapting their form or degree to the nature of the offence committed. And he forgets, or he is ignorant of, the efficiency of mere *moral punishments* in many cases—the tone, look, or gesture of reproof, or even of mere disapprobation.

Nor does man *make allowance* for the age of the offender; for the opportunity it has had of acquiring knowledge; for its degree of experience or education; for its power or want of self-control; for its natural aptitudes or temperament.

And equally little does he think of the peculiar circumstances under which offence has been committed; how far, for instance, it has been due to provocation, ill-usage, faulty education, or neglect by man himself. Rash, unthinking man is only too apt to inflict punishment in the heat of passion, during which he is careless of what he does, careless of a poor animal's feelings, careless of the result either to himself or the animal.

Nevertheless, all these sins of man's—whether of omission or commission, of ignorance, superstition, stupidity, or cruelty—tell at once on the behaviour, perhaps permanently on the character, of the animal punished. For, in the first place, the dog and other animals recognise the *justice* or injustice of their punishments; they feel or know whether or not they have *deserved* them; and they act accordingly, meekly accepting what they have deserved, but angrily resenting what has not been deserved. The consciousness of having committed a fault not unfrequently begets not only expectation of, but preparation for, punishment, in the horse (Youatt), dog, cat, monkey, elephant, and other animals; they anticipate retribution at man's hands as the natural or inevitable fruit of the transgression of some of his unwritten, unspoken laws.

Hence the necessity, in punishment as in education, for the study of an animal's *individuality* in determining the

form or degree in which punishment ought t[illegible] perhaps its advisability at all.

The *results* or effects of man's punishme[illegible] animals may be divided into those that are—

1. Beneficial.
2. Prejudicial; and
3. Useless.

The first class includes the *systematic* punishments of *education*—those that are as necessary in the case of the young animal as of the human child—guided, however, as they ought to be in both cases by the firmness and kindliness of a judicious, sympathising, intelligent teacher. As administered by such a man, what may appear to be severity may be quite compatible with the greatest humanity of disposition on his part. Nay, it may probably be the highest humanity to the animal itself.

Beneficial results include the conversion or convertibility of a pilfering dog into an honest and honourable guardian of the most tempting larder or food, into an animal strong, both of wish and will, to *resist temptation*. This is but one of the many triumphs of man's patience, perseverance, kindliness, and judiciousness in the systematic and thoroughly reformative *moral education* of the lower animals. This desirable cure, or curability, of vicious habits is sometimes brought about in a comparatively simple way. Thus Mrs. Mackellar tells us of a certain fox-terrier that was for a time a 'notorious thief.' 'It was only by letting him see his thefts restored to their proper owners that he was cured of the habit' of stealing. And here, be it observed, there was no punishment, unless it was a moral punishment habitually to give back before his eyes what it had cost so much trouble, probably, to abstract.

But such beneficent results, springing from man's kindliness, sympathy, intelligence, and judiciousness as a trainer, are rare compared with the prejudicial or *mischievous* effects of his evil temper or loss of temper; his inaptitude for self-control; his ignorance of animal character and of the principles of animal education; his superstition or prejudice. In many cases, punishment not only defeats its own end,

which is usually supposed to be, the *correction* of some fault, or bad habit, but it begets a dangerous feeling of antagonism, or antipathy, both to man and to the work to which he devotes this or that animal injudiciously punished. When a master is angry; when he is absurdly or cruelly severe in the form or degree of punishment administered; when punishment is inflicted on an innocent animal; when the punisher is a person whom the punished animal hates; when the animal is naturally irritable, or has been rendered unnaturally so by continuous ill-usage; and, finally, when punishment is improperly administered to animals labouring under various kinds of disease, mental or bodily, it is but natural that *viciousness* in the man should beget viciousness in the animal; that the latter should acquire a dislike, perhaps permanent, both to its work and its master; that its character should be vitiated by the development of rancour, resentment, moroseness.

In the case of punishment judiciously conducted for disciplinary purposes, the *dread* of punishment inspired by an experience of its discomforts, positive or negative, has a powerful influence in regulating action. It leads, for instance, to submission to man's superior will and superior intelligence; to exercise of the animal's own will in self-control, in the restraint of impetuosity, mischievousness, appetite, desire, passion of all kinds. This is a salutary and normal dread of punishment by man.

But in other cases, such a dread becomes *morbid*. Acted on by imagination, it begets suspicion and delusion, or ferocity and aggressiveness, and hurries the animal into acts dangerous either to itself, to other animals, or to man. This sort of *morbid fear* of man and his punishments, is the result, in nine cases out of ten, of man's cruelty, injustice, or thoughtlessness, in punishing animals that are innocent, that are conscious of having committed no offence against him; of his exercising undue severity, of not proportioning the form of punishment to the sensitiveness of the animal; or of his not taking into account its individuality.

Punishment is more or less *useless* or ineffective in many forms of mental defect or disorder; and there is a parallelism

in the human pupils of our schools, the crim
civilised populations, and certain savage race
such animals, or men, there is a perversion, or
moral sense, associated with a very *low degree*
telligence, if in some cases *intelligence* car
spoken of at all. They are equally uncor
criminality of their acts, and indifferent to
their offences. In other words, in such cases, the endeavour to eradicate bad habits, or to develop goodness, is simply useless.

The *will* appears to become, or to be *ab initio, powerless* to resist certain morbid impulses, for instance, to theft, in some monkeys. No punishment, no threats, no consideration of any kind, apparently, will suffice to prevent repetition of the same kind of offence.

In Eskimo dog teams, the injudicious correction of one by means of the whip leads the whipped animal to worry its neighbour, which in turn vents its anger or annoyance on the next, till the whole team is in a state of uproar, misrule, and unrule; and progress is stopped until rule is re-established, equanimity and harmony restored. Or, the animals 'dodge' to avoid the whip, entangle the traces, and, perhaps, upset the sledge. So that the *policy* of the human driver, if he has sense and profits by his experience, urges him at length to trust the team to the rule of the dog-leader, and the obedient following of its fellows (Parry).

In some sensitive dogs, or even breeds of dogs, no severity can be used in training: punishment of any kind renders them broken-spirited, produces inertness or apathy.

Dogs, and other animals sometimes *deprecate* man's wrath, try to avert expected punishment, by making efforts at *conciliation* or propitiation; in effect, they make eloquent *appeals for mercy*. They bring various *peace-offerings* to a master, and in various other ways express their *regret*, and their desire to make amends.

The dog and other animals also occasionally *intercede* between men, or with man, in order to the prevention of threatened punishment. Thus, a mastiff seized a master's arm to prevent him striking a terrier that had chased a pet cat (Wood).

On the other hand, various animals feel and express *delight* at the punishment by man of other animals that have ill-used or terrified them, or that are their natural enemies. Thus, a man killed an adder that had attacked a robin's nest. The parent bird perched itself on the man's left arm and 'watched, with unmistakable and intense delight, every blow inflicted by his right arm upon her merciless and dispirited enemy' (Wood).

The *forms* of punishment inflicted by man on other animals are not very varied. They are divisible into the (1) corporal or physical; and the (2) moral. The former include all kinds of kicks, blows, stripes or lashes. They are only too familiar. But a penalty that is perhaps less familiar, though even more severe and equally common, is the simple withholding of food, or in other words, *starvation*. This mode of punishment is common in the training of various animals, such as courier-pigeons, song-birds, sporting dogs, and performing animals in general, and it may therefore be designated educational. The crucifixion of lions is, or was at one time, common among the Arabs—the object being apparently punitive and deterrent (Pierquin).

Of the *moral* forms of punishment, the withholding of this or that coveted privilege, such as access to a room, or accompanying a master in his walks or sports, or the use of sarcasm and rebuke, are sufficient illustrations; and it has been already pointed out, more than once, that punishment of such a character is frequently more efficient in the dog, just as it is in the human child, than any merely corporal chastisement. In proportion, moreover, as man's attention is given practically to the *moral education* of the lower animals, the development and cultivation of their moral nature, moral means of punishment or correction will no doubt take the place of the revolting blows, bruises, kicks, or lashes, which at present create little public surprise, indignation, or protest, because man's own moral education is a subject to which he very seldom gives the slightest attention.

Many animals, such as the dog and cat, have a perfect understanding of the *nature and object* of penalties or punishments. They know that when they commit some for-

bidden act—something that man dislikes and prohibits—be it stealing from the larder or soiling a sofa, chastisement will or may follow in the form of a kick, or a blow, or the deprivation of some privilege; and they know, moreover, in such a case, that they have fairly earned some expression of a master's disapprobation or anger. They sin with a full fore-knowledge of the consequences. They know what is their sin, for what it is they are to be punished.

The doctrine of the metempsychosis, so prevalent among certain nations of the East, has had a wonderful influence in *preventing* the deserved *punishment* of various animals regarded as more or less sacred. It leads the Brahmins indeed to the absurd extreme of the deification of troublesome, if not noxious or dangerous, animals; to the harbouring or protection—feeding and consequent multiplication—of several that are usually regarded by ourselves as *vermin* of the most objectionable kind; a sort of *ultra-humanitarian protection* that is most inimical to cleanliness of person or to good general health in man. Before, however, we smile at or denounce such humanitarianism as Quixotic, let us remind ourselves that the tendency of the age in our own and other civilised countries is mischievously to do away with desirable punishment in man, the practical result of which is the holding forth of premiums for the increase, to an extent dangerous to our nationality, of various forms of social disease and vice —of drunkenness, criminality, and insanity.

CHAPTER V.

SELF-SUBMISSION BY ANIMALS TO MEDICAL AND SURGICAL TREATMENT.

CERTAIN animals, including especially the dog, horse, mule, elephant, and cat; but also the chimpanzee, orang, various apes, or monkeys; the pike, or other fishes; sheep, and other animals, not unfrequently become voluntarily *patients*—and sometimes notably patient, or submissive, quiet, and uncomplaining, as well as intelligent patients—of the physician or surgeon. Not only so, but having themselves experienced the benefit of man's medical or surgical skill, they bring their young, or their fellows, as patients to him, and they co-operate with the physician or surgeon in his treatment, either by showing the patients what to do, or by compelling their acquiescence in man's arrangements for their behoof. As medical or surgical patients, moreover, some of the lower animals stand in most favourable contrast to man—in respect, for instance, to their sagacity, self-control, fortitude, gratitude, or other virtues that are brought into prominence by suffering and its relief.

There are many instances of war or regimental *elephants* in India going regularly, day after day, of their own accord, to military *hospitals* to get wounds dressed, usually after having been taken there once or twice by their mahouts. They submit themselves to any necessary operations; understand the surgeon's object and co-operate with him; express pain, and relieve themselves by plaintive groans, though obviously regarding the infliction of pain as a necessary or unavoidable part of the operation; prepare themselves for suffering by drawing in the breath as man does; recog-

nise and put confidence in the surgeons' voices and persons as those of friends (Watson).

Of an adult male elephant we are told, 'that the surgeon might operate he readily extended himself on the ground, and bore with patience the application even of burning caustic. The acuteness of the pain would sometimes force from him a plaintive groan. But, to the doctor who, by inflicting momentary torments, sought to accomplish his cure, he expressed the liveliest emotions of gratitude.'

The different effects of physical pain, the power of controlling its expression and of quietly enduring it, are well illustrated respectively in old and young animals—the latter becoming frantic and ungovernable, while the former bear patiently, unresistingly, and as quietly as may be. The result of the experience of personal benefit is shown in the mother's treatment of her young one when it comes to require operative interference by man; she acts at once as *assistant* to the surgeon, and as *nurse* to her offspring, the patient. The mother elephant requires only to be instructed by man as to what is desirable, in order forcibly to hold her offspring to have its wound dressed, just as a judicious, strong-minded, affectionate mother would treat her child under similar circumstances. The mother elephant has the sense to prefer ultimate relief to temporary pain and inconvenience; she shows wonderful courage and self-control in the discharge of maternal duty.

Dogs frequently become surgical patients of man's, also exhibiting remarkable endurance of pain, remaining motionless during operation, and allowing themselves to be confined to bed during the tedious healing of wounds or repair of fractures (Low). Moreover, all this endurance, patience, docility, are not unfrequently exhibited by the most irritable, unamiable individuals.

A *bull-dog* that had broken one of its legs was placed on a sofa, where he lay quietly, although naturally fierce and unmanageable. When the fractured bone was pulled into position, 'he closed his eyes with the pain, but did not otherwise move.' When, in process of reunion of the fractured ends, his limb was re-examined, he laid himself on his back

and put up his leg. He broke his leg a second time, and underwent the same operation, 'with the same quietness and patience, though it must have been more painful than before' ('Animal World').

Another bull-dog, that had seen a broken arm of its master's repeatedly dressed by a surgeon, brought to the doctor's surgery a companion dog with a broken front leg, obviously introducing it as a patient. It gained admission by pawing or scratching at the door, and when the door was opened, the wounded dog held up its broken fore leg to show what was wanted. The fracture was set with splints just as was done in the case of the bull-dog's master. Here the bull-dog, an animal, by the way, not usually credited with sagacity, must have carefully watched the operations on its master's arm, must have understood their object, must have appreciated the result, and must have drawn the inference that what proved successful in its master's case would prove efficacious in its own, or in that of a fellow. A second canine patient presented itself at the door of the same surgery—in this case a single dog standing on three legs, the fourth limb having a pin sticking painfully in it. Here admission was gained by yelping, and the foreign body was extracted.

A well-known Manchester fire-dog occasionally, like the firemen, got wounded, and like them he submitted to be bandaged, poulticed, and plastered till he felt himself again able for duty, or was reported off the sick list by his (veterinary) surgeon ('Science Gossip').

A dog, whose temper is described as 'infernal,' having got his leg broken, became quite docile under surgical interference, 'allowing his limb to be set and laid in splints without showing the least anger, and being evidently grateful for the services rendered. . . Afterwards, when he happened to injure a paw, he went of his own accord to the surgeon, held up the damaged limb, and *asked* for help as plainly as if he had possessed human language' (Wood).

There are many dogs and other animals that will not suffer themselves to be meddled with, perhaps even approached, when in a state of health, which nevertheless

submit themselves quietly and gratefully to man's ministrations when they feel themselves ill. An old, feeble, asthmatic, withal irritable, pugnacious or fierce, terrier, will allow its mistress to bathe it and wrap it in blankets, and even to give it stimulants or drugs, without a growl, or even with faint and ungainly attempts by its looks or tail-wags at the exhibition of approval or gratitude.

In some cases man has to create in himself a fictitious *example* for his dog to follow; he has to mimic injury to himself, and the consecutive steps of its successful treatment, in order to induce a cautious or stupid dog to submit itself for real injury to similar surgical treatment. This was the case with Chabet's famous Eskimo dog, 'Fire-king,' that broke its leg after having been sold for 200*l*. Its master took it to a veterinary surgeon, himself pretended to have a broken leg, got it dressed, and by-and-by walked about on it as if it had quite recovered its strength. The dog then voluntarily submitted itself to a similar series of operations, 'occasionally licking the hand of the operator, but betraying no sign of impatience or pain.' It did so day after day till a satisfactory cure was effected, but never seemed to have detected its master's kindly and judicious ruse (Wood).

The endurance of *pain* without visible sign has been remarked upon as one of the characteristics of the shepherd's dog. And yet that and other dogs, as well as many other animals, *suffer and fear pain* as much as man does. To bear bodily pain without flinching, as the typical Red Indian, of fiction if not of fact, bears it, is indeed one of the Spartan virtues taught by animal parents to their young (Low). This endurance involves sometimes fatal mutilation of the most torturing kind.

During the Crimean War, Colonel Stuart Wortley's *cat* visited the doctor's tent to get a bayonet wound in the foot examined and bandaged. She was found by the colonel wounded after the capture of the Malakoff, and was by him taken daily for a time to the regimental surgeon to have the wound dressed. But when he became himself ill, and unable to take her as usual, she went herself, and 'sat quietly down for her foot to be examined, and have its usual bandaging.'

Another cat having a sick kitten apparently dying, after doing all she could for it without avail, at last laid it in her mistress's lap, the result being its ultimate restoration to health, and the mother cat's gratitude therefor (Wood). Incidents of such a kind—the seeking of *woman's aid* in the nursing of sick puppies or kittens—are by no means uncommon in mother dogs and cats. Nor is it unusual for bitches to bring their pups for man's inspection or admiration: maternal solicitude operating in the one case, maternal pride in the other.

A cat having been cured of diarrhœa by her mistress, brought her kittens for similar treatment for the same complaint, 'the cat standing by, evidently with full *faith* in my healing powers,' while the corrective food was being administered. Another cat having been cured of mange, brought others affected with the same disease to be similarly treated ('Animal World').

A fourth cat that had accidentally poisoned itself, 'came in a pitiful state of pain to seek its mistress's help. The fever and heat were so great that it dipped its own paws into a pan of water, an almost unheard-of proceeding in a water-hating cat' (Wood). Here we have an illustration of *self-treatment* in fever; but this subject of self-treatment, medical, surgical, and obstetrical, falls to be discussed in the following chapter, as does also the recognition by various animals of the *diseases* to which they are themselves liable.

There are many instances of military, or other *horses*, ponies, and mules betaking themselves of their own accord to blacksmiths' smithies for the purpose of having their feet re-shod, or nails extracted, or to hospitals for the treatment of wounds. Thus, we are told of a pony that had cast a shoe galloping to a blacksmith's forge with its rider on its back, and in spite of said rider (Wood). In most, if not all, of such cases, the animals had previously been in the habit of being taken to the 'smiddy,' or hospital, by their grooms or masters; they must have known why they were so taken, and they must have reasoned on the connection between losing a shoe, getting a nail impacted, or suffering a wound, and then

going to a farrier's forge, or veterinary hospital, for the proper remedy.

A wounded cavalry *horse* in India went direct to the sick horse stables: in other words, and in his own way, went to hospital and reported himself sick (Wood). At home, ordinary working horses frequently go voluntarily of and by themselves to the farrier's (Watson). Of one we are told that he 'trotted alone into a smithy where the day before he had been shod. He was lame, and on pulling off one of his shoes, it was found that a cruel nail had been driven into his foot.'

Mrs. Burton tells us of a Syrian *mule* that eloquently appealed to her to get a two-inch nail removed from its foot. She told its cruel drivers, who had not noticed the animal's lameness, 'You are greater brutes than the mule. He knows better than you do, and he came and *told* me himself' . . . . 'He hobbled up to me with his load, holding up the foot he could no longer set upon the ground, with an expression of mute, patient pain, which plainly said, 'You are my last hope, can you do nothing to save me?''

A *monkey* at Berlin, mentioned by Lady Verney, having a tumour requiring medical or surgical treatment, 'submitted patiently to the very painful remedies, swallowing quietly unpleasant physic, as if content to believe that its master knew best. The German report mentioned gravely how 'polite' (*höflich*) it was in its manners when it was ill; and how it '*shook hands* with its master before it died, with an apparent knowledge that it was going away.'

According to De la Brosse, a French navigator, who visited Angola in 1718, a *chimpanzee* being seized with sickness 'made the people attend him as if he had been a human being. He was even bled twice in the right arm, and whenever afterwards he found himself in the same condition, he held out his arm to be bled, as if he knew that he had formerly received benefit from the operation' (Wood). Büchner mentions an *orang* that died of alcoholic poisoning. 'During his illness his *pulse* was often felt. Every time his master came to his bedside he stretched out his paw to him.'

Watson cites the case of a pike, in which fractured skull produced great pain, leading to fury and suicidal at-

tempts. After successful surgical treatment by a humane surgeon, it showed its recognition of the services conferred by gratitude to its benefactor. The robin redbreast submits itself voluntarily to surgical operation by man ('Animal World'). Even in the intractable eagle Watson gives a case of patient submission to a surgical operation, and of judicious behaviour during convalescence. It tried or tested the use or usefulness of its wounded limb gradually, experimentally, by 'moderate and reasonable exercise.'

All such incidents, illustrative of sick or wounded animals submitting themselves voluntarily to man's remedial treatment, involve the possession and exhibition by the said animals of the following among other mental qualities:—

1. *Confidence in man*; in his power, as well as willingness to assist; in the superiority of his power to their own or that of their fellows: respect, therefore, for his superior wisdom and power.

2. The *memory of benefits* conferred, and the expectation of further and similar good service.

3. *Self-control* in repressing the natural expressions of pain, in subduing their natural distrust of, or enmity to, man.

4. Vivid appreciation of physical evil, and of the means necessary for overcoming, averting, or removing it.

5. Preference of temporary severe remedies to permanent or prolonged disablement or suffering.

6. That form of general intelligence known among men as *good sense*.

7. *Understanding of man's object* and the means of attaining it.

8. *Patience*, perseverance, fortitude, endurance.

9. *Gratitude*—permanent or temporary—for relief from suffering.

10. *Imitation*, which is sometimes largely operative.

11. *Co-operation* with man for their own good.

12. *Profiting by experience*.

13. The drawing of practical *inferences* or conclusions.

14. Sense of bodily *illness*; of recovery; and of the means by which the latter was brought about.

15. Sense of *failure*, of personal helplessness, of physical or other inability to compass certain ends.

So far from submission or submissiveness to remedial treatment, so far from voluntarily seeking his professional aid, there is probably a much more frequent violent struggling against man's interference—however kindly and well-intentioned, however much the animal may stand in need of it, however much such interference may be for its immediate or ultimate good. Such *resistance* to, instead of co-operation with, man arises generally, if not always, from a *misunderstanding* of man's motive or intention; and this misunderstanding, again, is usually the natural fruit of disease or defect, mental or bodily, including all the forms of *stupidity*.

Such misunderstanding is frequently associated with morbid fear of man as an enemy; and man has himself mainly to blame for the creation of such fear, not necessarily in the individual animal or by the individual man. If, in resisting animals, surgical or other interference is attempted, the struggles of the protesting animal may be so violent as to be much more dangerous to life than the diseased condition which is the subject or source of the ill-advised attempt.

Unfortunately, moreover, the same fears or misunderstanding, the same irritability and pugnacity that cause many animals to resist to the utmost all man's efforts for their benefit, when they stand in need of his assistance, lead them to oppose his efforts to benefit their young or their fellows. Thus the mother hippopotamus shows a dangerous ferocity in her refusal of man's aid or attentions to her young. Such unfortunate misunderstandings may lead, not only to refusal of man's aid in any form, but to repayment of his offered and intended kindness by assault. Thus a Turkish cock gave blows with his beak, and so *resented* what he probably regarded as unwarrantable interference with his personal prerogatives.

There are certain forms of what may be considered *medical* treatment by man to which dogs or other animals submit themselves most unwillingly. Dogs, for instance, suffer themselves to be victims—voluntary in one sense, involuntary in another—of certain cruel experiments by man, with the re-

sults of which they are by experience familiar. In the so-called Grotto del Cane, near Naples, dogs are the subjects of demonstrational asphyxia for the gratification of tourists. These poor animals have an idea of alternation, a knowledge of their turn or time about, a distinct perception of man's object, and of the results of what—having been repeated so frequently—does not deserve the name of an 'experiment.' They do not, however, conceal their disgust or dislike at the sort of confederacy in which they are engaged, at the dangerous part they are required to play. The slouched tail and hanging ears when their turn comes abundantly testify to the state of the feelings in these martyrs to popular science and popular curiosity (Buckton).

The lower animals do not betake themselves to man only for medical or surgical treatment. They appeal to him for assistance in all kinds of difficulty with which they feel or find themselves unable to cope. In a variety of most effectual, and frequently most pathetic ways, they present to him their *petitions*, prayers, entreaties for his aid or protection in their extremity, suffering, distress. Though not in words, the dog, horse, cow, even so really timid and reputedly stupid animals as the sheep and goose (or gander), virtually *ask* his assistance or services.

Thus many animals—some of them naturally very timid, and all of them more or less afraid of man as an enemy—*seek* his *protection* against enemies among themselves: and in doing so a major terror seems to overcome a minor one, they prefer possible safety to certain destruction. The robin redbreast, skylark, and many other small birds, flee at once for shelter to man's dwelling, or man's person, when pursued by their natural enemies, the larger birds of prey. A hare when hard pressed by dogs, has taken refuge under a woman's petticoats on the public highway. A pigeon chased by a hawk twice sought shelter in the bosom of the same young lady, while driving in a carriage (Jesse.)

Animals flee to man for succour in—

1. Bereavement; thus the mothers of abducted young appeal to man by their cries, coaxings, and caresses, to discover or restore their lost offspring. This includes the selec-

tion of man as a *foster-parent* for the upbringing of orphaned young. Thus a dying St. Bernard dog, on her death-bed, gave over her puppies as an obvious *bequest*—to a much loved and much trusted master (Wood).

2. Danger of all kinds, including extrication from entanglement, pitfalls, and other positions of difficulty; as where a tame rat awoke its master in order that he might go upstairs with it, and replace one of its young that had fallen from its cage; or where a gander used a similar means for the extrication of some of its young from a mill race (Wood).

3. Hunger: which leads the robin red-breast, for instance, to frequent man's dwellings in bad winters—or which led Dr. John Brown's terrier 'Nipper' to beg the assistance he could not himself render, to a starving pointer bitch, and her litter of five pups.

4. Despair: where man's protection is the only hope.

5. Prey or food catching or conveying, as where the cat begs its master to assist it in mouse-catching, young swallows appeal to man for aid in food-catching (Jesse), or Eskimo dogs ask man's aid in the conveyance of a dead reindeer (Wood).

Man's *assistance* is *requested* by certain animals, not only for behoof of themselves, their young, or their fellows, but also of his fellow man; and herein they frequently render the highest service to their masters or mistresses, or to the children, relatives, or property of these masters or mistresses. Thus, a dog, whose mistress is subject to epileptic attacks, whenever she has one runs to the nearest house for human assistance, seizing some woman's dress and dragging her away. If one refuses to accompany him, he seizes another and another, till his obvious and urgent *invitation* or *demand* is complied with ('Animal World'). Another dog brought timely aid to an aged nurse, affected with rheumatic fever, who had fallen from an arm-chair into or upon the fire, when nobody was present or at hand to come to her assistance. 'Without the dog she must have been burned to death' (Wood). In many instances, helplessly drunk masters have been, by their dog's intervention, saved from the consequences of their folly—from death, for instance, by exposure.

A pleasing and common result of man's good service to other animals is the development and exhibition of lively *gratitude*. Distinct *recognition of benefit* conferred by man is exhibited even by the bee. The form that the exhibition of it takes varies greatly, including many *bizarreries* of conduct. One of the most frequent forms of the manifestation of gratitude is *attachment* to man's person, an attachment that leads wild animals, for instance, to renounce their freedom and become domesticated. Thus a rook that had a wounded wing and was nursed by man till it could use its wing freely again, though set at liberty hovered about the house of its benefactor, obeying his call, coming to be fed in preference to foraging for itself, and following him from place to place, as a dog would do (Wood). A delicate chicken that had been carefully tended by a humane mistress until its restoration to health 'attached itself vehemently to its nurse, and used to follow her over the house, calling her anxiously until seated in her lap.' A short-tailed field mouse having been relieved from ticks, with which it was infested, 'did not try to escape, and on the very first day took food from the hand of its benefactor' (Wood).

Another common mode of expressing gratitude for benefits received and appreciated, is the presentation of various kinds of *goodwill offerings* to a master or mistress. In such cases, the grateful animal makes frequently, if not usually, what unthinking man may consider a most singular and unfit selection; as where cats bring a mouse —dead or alive—as their offering. But a little reflection will show us that in such a case the animal makes offering of what to her appears *most valuable*, and she does so at great *self-sacrifice*, involving what is probably dearer to her than her own life—the comfort or well-being of her progeny. For when offering a captured mouse to a mistress, the poor cat may not only be hungry herself, but she may have a famished litter of expectant, clamorous kittens. She, therefore, literally brings forth her *best gift* and places it on the altar of her gratitude.

CHAPTER VI.

SELF-SUBMISSION BY ANIMALS TO MEDICAL AND SURGICAL TREATMENT—*continued.*

WHEN the lower animals, or certain of them, are ill, or disabled, are in difficulty or danger, they do not necessarily resort to man for assistance, even though human aid is at hand and can be readily commanded. They not only *treat themselves*—but also each other, their young and their fellows—medically or medicinally, surgically and obstetrically.

As regards, in the first place, *medical* or medicinal *self-treatment*, certain animals, especially dogs and cats, use, for their own benefit, and in their own way, various natural medicines. They physic themselves—and much more rationally, it must be added, than the majority at least of civilised men or women do. The commonest forms of medicines so employed are *emetics* and purgatives in the shape of various grasses and other common native plants.

Several *grasses* get the credit of being eaten, or chewed simply, by dogs for the sake of their emetic action; and two at least apparently derive their specific names from this use of them by the dog—*agrostis canina* and *triticum caninum*. George R. Jesse describes a so-called 'dog-grass'—*cynosurus cristatus*—as the natural medicine of the dog, acting both as an emetic and purgative and used when it suffers from indigestion or other forms of illness. Porteous describes another 'dog-grass'—*triticum caninum*—as among the Lowthers in Scotland, 'a quick vomit for, and eagerly eaten at times by, dogs;' and he adds that sheep are fond of it in a snow storm, but that 'it has not the same effect upon them.' That pet dogs eat grass if they have opportunity is an every-

day occurrence, notorious to every intelligent observant child.

Berkeley refers the morbid appetite of swallowing wood, straw and garbage by the dog to its desire for a vomit. But, though this explanation may possibly satisfactorily apply to certain cases of morbid appetite in the dog, it does not apply to morbid appetite in general in other animals, or even in the dog. And Berkeley himself points out as inexplicable that the dog does not avail itself of its power of vomiting, almost at will, in order to get rid of poison administered to it by man: a circumstance the more remarkable that certain other animals—as will immediately appear, have a knowledge of the use not only of certain *poisons*, but of their *antidotes*.

Cats are represented as extremely fond of eating or chewing the roots of *valeriana officinalis* or other species of valerian—roots whose properties are in cats stimulant and intoxicant. They are also said to be very partial to what is in consequence called 'cat-mint'—*nepeta cataria*—though it does not quite appear that, either in this case or that of valerian, the plant or any of its parts is used as a *medicine*. In some cases, the animal would appear to revel in its mere scent or *perfume*. This, for instance, seems to be the reason why cats are as passionately fond of *nemophila* and marjoram as of valerian. 'They no sooner scent it than they throw themselves upon it and roll over and over with the greatest sense of enjoyment.'

Gillmore points out as regards the dog, and Stables in reference to the cat—when domesticated, and especially in proportion as their liberty is restricted—their life luxurious and artificial, and the bowels constipated—the importance of allowing them access to their own *natural remedies*—aperients or emetics—grasses of various kinds or other plants. Were this done, there would be small need for the veterinary surgeon in the treatment of the luxury-bred ailments of the dog or cat, small need for the drenching and drugging to which at present these animals are so injudiciously subjected.

Various animals again use *salt* or certain saline substances, partly as aperients, partly as tonics, partly as indispensable

ingredients or constituents of food. Thus the buffalo 'used to lick greedily,' for the animal is now rapidly disappearing before civilisation, the saline incrustation deposited on the borders of salt lakes in various parts of North America (Grant). Mongolian camels eat pure salt if they cannot get at a similar saline efflorescence that covers the marshes and often exudes from the soil on the grass steppes of Central Asia. On them salt, in whatever form, acts 'as an aperient, especially if they have been long without it' (Prejevalsky).

Porteous says of hemlock—*conium maculatum*—that its 'roots are eaten by cattle when unwell.'

Certain animals are acquainted with the action of certain natural poisons, and act upon their knowledge either by using these *poisons* themselves, or by applying the appropriate natural *antidotes* when they find themselves unavoidably poisoned. Thus some birds poison their captive young, apparently regarding their death as preferable to imprisonment.

On the other hand, the Indian mongoose, poisoned by the snake which it attacks, uses—appropriately as to time and otherwise—the antidote to be found in the *mimosa octandra*. 'Its value both as a cure and as a preventive is said to be well known' to it. 'Whenever, in its battles with serpents, it receives a wound, it at once retreats, goes in search of the antidote, and having found and devoured it, returns to the charge, and generally carries the day, seeming none the worse for its bite' (Miss Gordon-Cumming). Again, a toad, bit or stung by a spider, repeatedly betook itself to a plant of *plantago major* and ate a portion of its leaf, but died after repeated bites of the spider, when the plant had been experimentally removed by man ('Science Gossip').

Poison-bearing animals are, some of them at least, aware of the effect of their own stings on their prey: for the scorpion, for instance, sometimes deliberately uses its own sting upon itself for suicidal purposes.

It must be remembered, however, that plants or other substances that are medicinal or poisonous to man or to certain animals, are not necessarily so to other animals. So little may this be the case, that reversing the proverb that

applies to man, as to one man's meat being another man's poison, what is poisonous to man or to certain animals may furnish a favourite and harmless food to certain others, as I have elsewhere pointed out.[1] Thus the common goat eats with impunity hemlock, henbane, and digitalis, which are either distasteful or deleterious to other ruminants (Prof. Bell), and are deadly poisons to man.

Whether or not any *intention* be involved, whether there is any definite conception of an object, or the means of its attainment, whether cleanliness be adopted as a sanitary precaution, it is nevertheless a fact that various animals take better means to secure the *healthiness* of their persons and dwellings than man, even when highly civilised, generally does. We may point, for instance, to—

1. The careful removal of excrement from nests or lairs by birds and quadrupeds (White); or

2. The ingenious provision sometimes made by other animals for—

a. Ventilation.

b. Warmth, by exposure to the sun.

c. Protection from cold, rain, and wind.

The most familiar forms of *surgical* self-treatment by animals are the gnawing off, or otherwise sundering imprisoned limbs, in order that the rest of the body may escape capture—that life itself may escape sacrifice by ruthless man. Thus the rat, caught in a trap, gnaws off its own limb, or it is assisted to do so by some one or more of its fellows (Jesse). It makes a voluntary and deliberate sacrifice of a limb to life and safety.

There is another class of surgical operations of a very different kind also performed, however, on animals by themselves: those to wit which are the result of imitation, as in the monkey. They are frequently fatal in consequence of the injudiciousness of the imitation, the inability of the animal properly to execute in duplicate the performances of its master, the misunderstanding by the monkey of the operation itself, its object, or the means of performing it.

[1] *Vide* Bibliography.

A third and still more interesting class of cases is represented by the chimpanzee, soko, or other anthropoid apes, *staunching* by means of their hands or fingers, or of leaves, turf, or grass stuffed into them or otherwise, and acting as compressants, absorbents, or styptics, their own *bleeding* wounds, produced by man (Livingstone).

Many animals *lick* their own or each others' *wounds*, and there is evidence, not sufficient however either as to quantity or character, to show that this operation has a *therapeutic* effect. Thus bears lick the wounds of their cubs.

Somewhat allied to surgical operations are the efforts of various animals, such as the horse, dog, cat, ox, sheep, monkey, to free themselves of *vermin* or of the itchiness usually caused by vermin, by the use of their paws or teeth, in picking, biting, or scratching, or by simply rubbing the body or parts thereof against trees, walls, fences, or rails.

While many animals thus deal with *themselves* medically, medicinally, or surgically, the value of *co-operation*, the need of assistance, is usually recognised, and hence the frequency with which they seek and obtain surgical, medical, obstetrical, or other aid. Such aid is offered also without its being sought for, as in the case of mothers with their young, or of the able-bodied with the helpless or the orphaned. Monkeys clear the skin from vermin in the dog, cat, and parrot; and the bitch does so in her puppies, just as baboons are hired out to do such a service for man himself (Houzeau).

Various animals gnaw through the umbilical cord of their offspring. *Obstetrical* assistance is given to each other by cats. A species of frog has the distinctive or specific appellation *obstetricans*—it is known as the 'obstetric frog;' and a similar designation might be fittingly applied to certain ants. A mother cat employed a *nursemaid* in the person of a half-grown kitten, placing her in charge of her litter (Wood). A greyhound also, 'having a larger litter than she could well bring up herself,' hired a *wet nurse* in the form of a common collie bitch, 'who came at regular stated times, and was rewarded for her services by having served out to her by the mother a supply of meat and bones;'

'literally the fact,' says the narrator (Wynter), and there is no good reason to doubt that it is so.

A dog performed a *surgical* operation on a cat—excision of its tail, which had been nearly cut in two by a tin kettle tied to it. The end portion of the tail was simply bitten off by the dog, to the cat's immediate relief, and a loving companionship was the result—a fact significant to those who erroneously apply the term 'cat and dog life' to unseemly *human* squabbles. The same dog, when a kitten that he was in the habit of teasing got scalded, and had her sores dressed, gently licked them—a common mode of *treating sores* by and among the lower animals. By and by a tumour, which proved ultimately malignant and fatal, appeared on the kitten's neck. She got the dog to lick it as he had done her other sores, 'touching him with her paw when she wished to be licked, and again when she wished him to desist:' and holding up her head in order that he might properly reach her neck (Wood).

The oxpecker—so called—extracts the larva or caterpillar of the troublesome bot from the backs of cattle in Africa—from the swellings caused by these bot-larvæ and known as 'worble,' 'an operation seemingly conducted with gentleness and skill, and apparently relished as a relief from pain by the subjects of the operation, the oxen evincing no uneasiness or objection consequent on the attention of these birds.' Of a similar kind are all operation for the removal of parasitic *vermin*, such as lice, fleas, bugs, ticks, and the larvæ of bot and other flies, from each other's skins, furs or feathers. In all such cases a double advantage is usually gained—the relief of suffering on the one hand, and the use of the captured vermin as food on the other. Starlings in this country do for sheep what the oxpecker does for the ox in Africa—rids them of troublesome larvæ. The monkey searches for and eats the lice or fleas of dogs, and ants eat up the parasitic mites of drone bees (Houzeau).

The lower animals give each other important aid in various ways that do not belong to the category of what is medical, surgical, or obstetrical, and yet are allied to this category. Thus the phenomena of foster-parentage, described in

another chapter, abound in instances of the most careful *nursing* from birth upwards of all manner of orphaned or deserted young. And there are many other instances of various forms of nursing the sick or wounded—the young or aged—or of assisting in such nursing. In such cases there is a voluntary assumption of what cannot fail to be, in some respects, an irksome duty. There is a regular caste of nurses among ants. Those that are a little ill, or that have been slightly wounded, are carefully tended by their companions within the nest: while those dangerously ill are carried outside to die (Forel and Elvard).

Gratitude requires that we should not forget the extent to which, and the singularly faithful, tender, self-sacrificing manner in which certain animals—especially the dog, elephant and horse—nurse *human infants* or even adult men. This nursing involves a great variety of tender services indicative of much consideration, sagacity and sympathy.

Nursing the sick implies, of course, caution or care to avoid hurting or paining them, and this is frequently exhibited by the elephant, horse, dog, and cat. Thus a dog has been seen supporting the broken leg of another (Wood). A dog scalded by a kettle suddenly 'boiling over' on a kitchen fire, carried an unharmed companion kitten to a place of safety (Jesse)—another instance of the virtues—not the vices—of real 'cat and dog life.' A terrier watched over a sick cat, preventing disturbance by intruders. Another terrier acted as nurse to kittens in their mother's absence, defending them in the same way against any meddlers—resigning his charge, however, immediately on the mother cat's reappearance (Wood). A ferocious bull-dog carefully picked up a kitten that had fallen from a height of three storeys, getting thereby so much hurt and crushed 'that even its own mother would not go near it:' he took it to his kennel, licked it clean, and nursed it tenderly till it died (Wood).

On the other hand, though not so frequently and not to the same extent, nor in the same useful practical way, the *cat* sometimes pays its attentions to the sick or disabled dog. Thus, a turnspit having had a 'fit' (probably epileptic) and being unable to move for some hours, a companion cat 'came

frequently to inquire for him and greeted him with a kiss' (Wood).

A spaniel shared its food with an unpopular cock that was tyrannised over and ostracised by the other poultry in a certain poultry-yard. The cock was 'not allowed to have a share of what was going, but was punished severely whenever he made an attempt to get any food.' The dog stood on watch, while the cock ate a portion of the meals so charitably allotted to him: and if necessary to secure him against annoyance, he was fed in the dog's kennel. Notwithstanding all this kind attention the cock was ultimately 'found dead' in the dog's kennel, a 'case' probably of 'broken heart' —the result no doubt of physical illness brought on by worry, by perpetual bullying, and by all manner of ill-usage. It is affecting to note that the dead cock when discovered was 'lying closely pressed to his only friend' (Wood).

A weasel inspected another that had been injured by a horse's hoof—paralysis from spinal injury having apparently resulted, and then carried it to the side, from the centre, of a public road (Wood). Not unfrequently, certain of the lower animals render similar service to drunken men or to helpless children that are in harm's way on the public high-road. Thus elephants and horses have, by means of their trunks or teeth, gently lifted and placed aside and in safety prostrate men or toddling infants that would otherwise have been crushed under their hoofs and those of their followers in a procession or cavalcade.

A certain cat was barren after losing by death one kitten, while her mother continued prolific. Whenever the grandmother left her kittens longer than her daughter considered prudent, 'she would call her and drive her' to them: 'giving her an unmistakable box on the ear and a scolding for her neglect.' When these well and ill-tended kittens became too large and heavy for the grandmother to carry alone, their elder (step-) sister assisted to bear the burden—the one relative taking the neck and the other the hind-legs of each kitten (Wood). In another case a strong cat helped a weak, delicate mother (cat) to carry her kittens from place to place.

Rescue and *resuscitation* from drowning may also fitly be

mentioned here. Even a bee in a state of insensibility from partial drowning has been recovered by its fellows and resuscitated, and the same has been noted among ants (Figuier).

An old disabled tom cat made a bargain with a young active one to catch mice for him, the young assistant being paid or repaid with bones, and cats' meat, the compact being honourably carried out on the part of both (Wynter).

A sheep, whose lamb was entangled in a briar hedge, went to a flock for a ram, who returned with her, and by means of his horns freed the captive. Another sheep got a cow to raise a fellow sheep that had so fallen on its back as to be unable to get up without help: the cow's horns at once did what was necessary (Macaulay). A well-bred shepherd's dog gently assists a fallen sheep; while he is recognised by the flock he tends as a friend and protector, to whom therefore its members willingly submit themselves in emergency (Trimmer). Here, as in so many other cases, *individual superiority*, mental or physical, or the two conjoined, is practically and readily recognised.

It is common for small dogs to seek the aid of large ones for the punishment of their foes, and instances are on record of both seeker and sought-for having gone long journeys for this purpose—of executing vengeance.

An old lioness, well known in the Zoological Gardens, Dublin, which died there in 1876, being prostrated with chronic bronchitis, and too feeble to help herself, was much annoyed by rats nibbling at her toes. To destroy the rats the authorities of the gardens most judiciously made the experiment of introducing into the lioness's cage a good ratting terrier. The dog was received, and naturally, with an angry growl; but as soon as the lioness saw how her companion treated his first rat, 'she began to understand what the terrier was for,' to what important service he was applying himself, and immediately her behaviour towards him was changed. She now 'coaxed him to her side, folded her paws round him, and each night the little terrier slept at the breast of the lioness, enfolded with her paws, and watching that his natural enemies did not disturb the rest of his mistress.'

Animals seek the same protection from *each other*, the weaker from the stronger, that they sometimes do from man. Thus a Danish dog always rushed for protection to the kennel of a bloodhound if threatened with punishment (Wood).

Man himself sometimes seeks from the lower animals that sort of protection which he cannot expect, or at least so readily obtain, from fellow-man; as when a tipsy sepoy gets beneath the body or between the legs of an elephant as a shelter and defence against a picket of his fellow soldiers. From such a covert they find it impossible to dislodge the delinquent; for the kindly and sagacious animal, having a favour for the man who so confidently commits himself to its more than hospitality, is ready to defend him to the death against any attempt at his capture.

All such incidents—all illustrations of self-submission by animals to medical or surgical treatment by man; of self-treatment, medicinal, surgical, or obstetrical; or of co-operation or assistance in sickness or disablement of whatever nature—bring into prominence the following among other mental qualities that deserve consideration:—

1. *Sympathy* with every kind of distress or difficulty suffered by others—sympathy of that practical kind, moreover, that leads at once to the efficient assistance or relief of those who obviously require help, whether they be other individuals of the same species or of other species and genera, including man himself.

This sympathy is not unfrequently expressed in the most delicate way, for instance by cats and dogs to masters or mistresses. Thus two terriers took upon themselves to watch, if they could not otherwise nurse, a sick master. If one left the sick-room the other always remained behind: the invalid was thus never during his illness left alone by his canine friends. In another case 'a dog always slept at his master's bedroom door when he (the master) was from home, as if to protect his mistress . . . . This he did at no other time' (Jesse). Wood gives the case of a dog whose mistress having become ill, went of its own accord to summon her parents to her bedside. Again, a lamb, when its mistress

was ill, 'left its usual place of abode, lay beneath her bed, and refused all food, although the milk was offered from the usual bottle' (Wood).

It is sympathy in great measure that leads so many birds and other animals to become *foster parents*, by adopting and bringing up the lost, deserted, or orphaned young of other individuals or species, as well as to give *thank-offerings* comparable with those already spoken of as the fruits of gratitude.

What is of interest, moreover, animals not only feel and offer, or express, but *solicit sympathy* in illness, ill-health, or bereavement; they obviously feel its value and necessity. Thus we are told of a cat that solicited sympathy on and for the death of her first grandchild, and of other animals that did the same in the course of their own illnesses (Wood).

The practical expression of sympathy involves charity, benevolence, generosity, and other virtues.

2. Recognition of the *helplessness* or powerlessness produced by illness or injury.

The result of such recognition is not necessarily sympathy for, with or without assistance to, the helpless animal: on the contrary, it is quite as common probably for the able-bodied animal to take immediate advantage of the weakness of its disabled fellow, for instance, by making prey of it. This kind of heartless *selfishness* is extended not only to other species and genera, including man himself, but to other individuals of their own species, in such forms as *cannibalism*. In such cases the tyrants know their power, while their captive or diseased victims feel, with what anguish we cannot gauge, their being at the cold mercy of the relentless strong.

The recognition of helplessness involves that of all manner of *defect and ailment, mental as well as physical*, and the recognition is sometimes more speedy in other animals than in man himself. Thus not only does an animal mother recognise in her progeny physical or mental defect of a kind or degree that escapes the observation of man, or before it has attracted man's notice; but she lavishes her affection—as does so frequently the human mother—on that member of her family that obviously stands most in need of her ministrations.

Maternal affection among birds, deer, and other animals is frequently bestowed mainly on the *weakest* of a brood or family: mothers feed and tend their weaklings with conspicuous assiduity (Jesse). Just so does the human mother tend her diseased, deformed, or idiotic child.

In the camel herd of Warburton, in his journey across Western Australia, when, on a critical occasion, the master bull had poisoned itself, and was consequently ill and temporarily helpless, the young bulls became aware of the fact almost before it was apparent to the camel-men—with this practical and serious result, that these young animals at once showed signs of insubordination both to their own leader—the master bull in question—and to their human masters; in other words, they took immediate advantage of circumstances.

The sense of helplessness includes further the sense of *futility of effort*, of the vainness, hopelessness of further attempt at defence or escape; and it begets, therefore, *despair*, with all its results of whatever kind. These results are of a very opposite kind, for despair begets in one animal a condition of fury or frenzy, urging it to behaviour of an immediately self-destructive character, and in another a paralysis of thought and effort, or a morbid indifference, that bring about its doom with equal certainty, and perhaps with greater torture, though not so speedily. This sense of personal helplessness, of want of power or ability to compass some desired end, is associated with the sense of difficulty or danger and of need for other help than their own.

On the other hand it is quite as common for animals not to perceive the uselessness of their sacrifices or labours, a subject treated of in the chapters on 'Errors.'

It is important to bear in mind that, just as certain animals are keen and ready at observing, and sometimes at taking advantage of physical impotence or disability in each other, they also appreciate *man's infirmities*, both of mind and body. In some cases they make kindly allowance for them. Thus we are told that Sir Edwin Landseer's terrier 'Tiney,' when it begged from Mr. Charles Landseer, who was deaf, 'invariably barked in a much louder note than when addressing any other member of the family' (Macaulay). And

it is notorious that even captious dogs make ample allowance for the thoughtlessness and helplessness of human infancy.

3. A clear perception of the nature and extent of *danger*, and of the different kinds of danger, including—

a. Sometimes a decided *preference* of one (minor) to another (major) risk.

b. A consideration of the various means whereby danger may be avoided or escaped from. They discriminate between a certain enemy, or danger, and a possible friend, or safety.

4. The ready *conveyance of intelligence* of events, the communication to each other of their desires or wants, the arranging of plans, bargains, or compacts.

5. *Willingness to help* each other; good nature in bestowing aid where and when asked and required; the rendering of mutual assistance appropriate as to time and character.

6. *Knowledge* of the use or object of *emetics* and *purgatives*, as well as of the nature of *wounds*, and of *remedies* and their action, whether medical, medicinal, or surgical.

Possibly the dog and other animals recognise or understand the nature, or at least the dangerousness, of some of their own *diseases*—a knowledge which leads, for instance, to avoidance of diseased fellows. They would appear to be acquainted with the fact of the *contagiousness* of certain diseases; that contact with, or contiguity to, animals showing certain symptoms may develop like bodily disorder in themselves. At all events, we are told that hounds, for example, frequently show very decided *fear* of their rabid companions (Fleming); and that a sheep, when affected by a fatal form of dysentery locally known (in the southern highlands of Scotland) as 'breakshugh,' 'instantly withdraws from all the rest, shunning their society with the greatest care. It even hides itself, and is often hard to be found' (Hogg).

Here, then, are two cases of an opposite kind; the hounds avoiding the diseased individual, and the diseased sheep isolating itself from the sound members of the flock. This avoidance or isolation—if and where it exists—may very readily and naturally arise from the biting or other dangerous or singular habits of their companions. But from what we

know of the keen observation of facts connected with physical, and even mental conditions in their young, their mates, their companions, their leaders, even in man, there is no room for doubt that notice of the symptoms of disease, and inference as to the dangerousness of given diseases, falls quite within the powers of the dog, cat, and many other animals. They readily read the signs of suffering in man, the signs of character, even; they can follow man's moods or feelings, interpret his feature-play with such nicety as apparently to foresee and forestall his very intentions; and there is, therefore, nothing strange in the supposition that they can equally well read the signs of disease in each other.

Nor, indeed, is there good ground for doubting that animals can communicate to each other their morbid as well as healthy feelings. Why should we believe for a moment that the free and full intercommunication of ideas, feelings, wants, wishes, is confined to their *normal* condition or expression?

APPENDIX

ILLUSTRATIVE OF

THE NATURE AND VARIETY OF THE DATA ON WHICH THE AUTHOR'S GENERALISATIONS HAVE BEEN BASED.

BIBLIOGRAPHY.

THE main objects of the following catalogue of works—of all kinds—which illustrate the statements made in the preceding text, are

1. To point out the *kind* of published sources, other than personal observation, from which the author derived the facts that formed the bases of his generalisations; and

2. To indicate to the reader, who may desire to supplement the fruit of his own observation or research by comparing it with the result of the inquiry of other labourers in the same field, the sort of guides who may lead him to a continuance of his research in any given direction.

The following list does not profess to be complete or exhaustive. It is simply typical, being confined to works consulted by the author, and for the character of which he can personally vouch. It gives but a general idea of the number and variety of printed works from which assistance may be sought by that class of students who are fonder of bibliographical research than of the direct investigation of nature. The list of books is confined almost exclusively to those published in Britain and in the English language. But similar works probably abound in every one of the leading countries and languages of the world. They are at all events numerous in Germany and France, and in the German and French languages. So numerous and varied are they in the English language that they might be cited to a perplexing and wearisome extent.

The following selected list of works has been *alphabetically* arranged, according mainly to the *names of authors*, whose scientific designations, where they possess any, have been added. The object in so doing has been simply this. It is presumable that a Fellow of such learned societies as the Royal Societies of London or Edinburgh, or of the Linnean or Zoological Societies of London, is competent both to observe and record facts in Natural History; more competent at least than the uneducated or unskilled popular writer or compiler. The same remark applies, in a minor degree, to all men of university training and possessed of university degrees—such as those of M.A., M.D., LL.D. and D.D. But whether or not such persons are to be considered absolutely trustworthy as the observers and reporters of what they have themselves seen in animated nature, they are

still known gentlemen of position, to whom application can at any time be made for the verification of facts stated by them, inasmuch as all our learned societies and universities keep annually printed lists of the addresses of their fellows or graduates.

Were any further guarantee required than such learned designations as F.R.S. or F.L.S. of the competency of their bearers to address the public with authority on matters of fact, the author might add this—that several of the gentlemen or ladies whose names occur in the following bibliography are or were personally known to him, in so far as (1) he has either merely met them, or (2) has known them more or less intimately for a series of years, while (3) with others he has had correspondence.

Reference may be made also for designations of, and comments upon, many of the books mentioned, to the *Bibliographies* appended to the Author's papers on—

1. The Physiology; and
2. The Pathology

} of Mind.[1]

ENUMERATION OF SOME OF THE WORKS CONSULTED BY THE AUTHOR.

I. ADAMS, Andrew Leith, M.B., M.A. and F.R.S., formerly Surgeon of H.M. 22nd (Cheshire) Regiment, now Professor of Zoology in the Royal College of Science, Dublin.

1. 'Field and Forest Rambles of a Naturalist in New Brunswick: with Notes and Observations on the Natural History of Eastern Canada.' Illustrated; 8vo. London, 1873.
2. 'Wanderings of a Naturalist in India, the Western Himalayas and Cashmere.' Illustrated; 8vo. Edinburgh, 1867.
3. 'Notes of a Naturalist in the Nile Valley and Malta.' Illustrated; crown 8vo. Edinburgh, 1870.
4. 'The Intellectual Powers of Birds,' *Popular Science Review* for July 1873.

II. AGASSIZ, The late Professor Louis, of Harvard University, Cambridge, Massachusetts (U.S.A.).

'Outlines of Comparative Physiology,' edited by Dr. Wright. London, 1867. There is a chapter (p. 89) on 'Intelligence and Instinct.'

III. ANDERSON, John, M.D., F.R.S.E., F.L.S. Curator of the Imperial Museum, Calcutta.

'Mandalay to Momien; a Narrative of the two Expeditions to Western China in 1868 and 1875,' of both of which he was the scientific officer. Illustrated; 8vo. London, 1876.

IV. ANDERSSON, the late Charles John, a Swede and distinguished South African traveller and hunter.

1. 'The Lion and the Elephant,' edited by L. Lloyd, himself both a traveller and sportsman. Illustrated; 8vo. London, 1873.

Besides giving the results of Andersson's own observations, the work contains a summary of those of such celebrated African travellers or sportsmen as Gérard, Gordon Cumming, Harris and Moffatt, as well as of the Editor.

2. 'Notes of Travel in South Africa,' also edited by Lloyd; demy 8vo. London, 1875.

[1] *Vide* present Bibliography, No. LXXXIII.

V. 'ANIMAL WORLD, The,' a monthly illustrated serial, the organ of, and 'issued by the Royal Society for the Prevention of Cruelty to Animals.' Published in London.

VI. 'ANTHROPOLOGICAL REVIEW, The,' an occasionally illustrated 8vo quarterly; begun in 1863 and continued till 1873, when it was succeeded by the 'Journal of the Anthropological Institute of Great Britain and Ireland.'

VII. ARGYLL, The Duke of.

'Animal Instinct in its relation to the Mind of Man.' *Contemporary Review* for July 1875.

VIII. AUDUBON, the late John James, the celebrated American Ornithologist.

'Life and Adventures of,' by Robert Buchanan; 3rd edition. London, 1869.

IX. BAIRD, the late William, M.D., F.R.S., of the Zoological Department of the British Museum, London.

'Cyclopædia of the Natural Sciences.' Illustrated; 8vo. London, 1861.

X. BAKER, Sir Samuel W., M.A., F.R.S., otherwise and sometime 'Baker-Pasha' of the Egyptian service.

1. 'Ismailia,' 2 vols; 8vo. Illustrated. London, 1874.
2. 'The Albert N'Yanza, Great Basin of the Nile and Exploration of the Nile Sources,' 3rd edition, crown 8vo. Illustrated. London, 1876.
3. 'The Nile Tributaries of Abyssinia and the Sword Hunters of the Hamram Arabs,' 4th edition. Illustrated; crown 8vo. London.
4. 'Eight Years in Ceylon,' 8vo. Illustrated. London, 1874.

Contains a special chapter (9) on 'Instinct and Reason' in the lower animals.

XI. BATES, Henry W., F.L.S., Assistant Secretary of the Royal Geographical Society, London.

'Records of a Naturalist on the River Amazons during eleven years of Travel and Adventure,' 3rd edition. Illustrated; crown 8vo. London, 1873.

XII. BELT, the late Thomas, F.G.S., Mining Engineer of the Chontales Gold Mining Company, Nicaragua, from 1868 to 1872.

'The Naturalist in Nicaragua; with Observations on Animals and Plants in reference to the Theory of the Evolution of Living Forms.' Illustrated; post 8vo. London, 1874.

XIII. BENNETT, George, M.D., F.L.S., of Sydney, New South Wales.

1. 'Wanderings in New South Wales, Singapore and China,' 2 vols.; 8vo. London, 1834.
2. 'Gatherings of a Naturalist in Australasia: being Observations principally on the Animal and Vegetable productions of New South Wales, New Zealand, and some of the Australasian Islands.' Illustrated; 8vo. London, 1860.

XIV. BERKELEY, The Honourable Grantley F.

1. 'Fact against Fiction; the Habits and Treatment of Animals practically,' 2 vols.; 8vo. London, 1874.
2. 'The English Sportsman on the Western Prairies.' Illustrated; royal 8vo. London, 1861.

XV. BRODIE, The late Sir Benjamin C., F.R.S.

'Psychological Inquiries; in a Series of Essays intended to illustrate the Mutual Relations of the Physical Organisation and the Mental Faculties,' 2 vols. 8vo.; 3rd edition. London, 1862.

XVI. BRODERIP, The late W. J., F.R.S.

'Zoological Recreations.'

Several editions have been published, of which the most recent is as one of the volumes of 'Beeton's Boys' Own Library,' 8vo. London, 1876.

XVII. BROUGHAM, The late Lord.

'Dialogues on Instinct,' one of 'Knight's Weekly Volumes.' London, 1845.

Contained also in all editions of Lord Brougham's works, of which the latest and best is that of Messrs. A. and C. Black, of Edinburgh, 1872–8.

XVIII. BROWN, John, M.D., F.R.S.E., of Edinburgh.

'Horæ Subsecivæ;' 7th edition; 8vo. Edinburgh, 1861.

Contains 1. 'Rab and his Friends;' and 2. 'Our Dogs;' of both of which several editions of separate reprints have been published.

XIX. BROWN, Robert, M.A., Ph.D., F.L.S., F.R.G.S.

'The Races of Mankind; a popular description of the Characteristics, Manners, and Customs of the principal Varieties of the Human Family,' 4 vols. Copiously illustrated. London, 1873–6.

XX. BROWNE, W. A. F., M.D., LL.D., F.R.S.E., formerly one of H.M.'s Commissioners in Lunacy for Scotland.

1. Articles in 'Chambers's Encyclopædia' relating to the Natural History of Human Idiocy, Imbecility and Insanity.
2. 'Dreams of the Dawn and Sundown of Philosophy,' being a pamphlet consisting of a series of reprints from the *Dumfries and Galloway Standard*; small 8vo. Dumfries, 1875.
3. 'Stories about Idiots,' a similar reprint from the *Dumfries Courier*. Dumfries, 1873.

XXI. BÜCHNER, Dr., of Darmstadt, Germany.

'Man in the Past, Present, and Future,' translated into English by W. S. Dallas, F.L.S.; 8vo. London, 1872.

XXII. BUCKLAND, Frank, M.A., F.R.S., Editor of *Land and Water*.

1. 'Curiosities of Natural History,' of which there are several editions, the last being the 'People's Edition,' 4 vols.; fcap. 8vo. Illustrated, London, 1872–4.
2. 'Logbook of a Fisherman and Zoologist,' 8vo. Illustrated. London, 1875.

XXIII. BUIST, Miss K. A., daughter of the late Dr. George Buist, of Bombay, a well-known Indian littérateur.

'Birds; their Cages and their Keep; being a practical Manual of Bird-keeping and Bird-rearing.' Illustrated. Crown 8vo. London. 1874.

XXIV. BULLER, Walter L., D.Sc., F.L.S., of Wanganui, New Zealand.

1. 'History of the Birds of New Zealand,' beautifully illustrated by Keulemans; 4to. London, 1872–3.
2. 'On the Structure and Habits of the *Huia* (*Heterolocha Gouldi*).' *Transactions of the New Zealand Institute*, vol. iii., 1871; as well as
3. Numerous other papers, in the same *Transactions*, on Bird-habits that evince the possession of Mind or Reason.

XXV. BURTON, Capt. Richard F., sometime H.B.M. Consul at Damascus and Trieste.

'Two Trips to Gorilla Land and the Cataracts of the Congo,' 2 vols. 8vo. Illustrated. London, 1876.

XXVI. BURTON, Mrs. Isabel, wife of Capt. Burton.

'The Inner Life of Syria, Palestine, and the Holy Land,' 2 vols.; 8vo Illustrated. London, 1875.

XXVII. BUTLER, Major W. F., C.B., F.R.G.S.

1. 'The Wild North Land: the Story of a Winter Journey with Dogs across Northern North America;' demy 8vo. Illustrated. 4th edition. London, 1873.
2. 'The Great Lone Land: an account of the Red River Expedition of 1869–70; subsequent Travels and Adventures in the Manitoba country; and a Winter Journey across the Saskatchewan Valley to the Rocky Mountains;' 6th edition. Illustrated. Crown 8vo. London.

XXVIII. CARPENTER, Wm. B., M.D., LL.D., F.R.S., one of the ex-Presidents of the British Association for the Advancement of Science.

1. 'Principles of Mental Physiology;' 8vo. London, 1874.
2. 'Principles of Comparative Physiology,' 4th edition; 8vo. London, 1854.
3. 'On the Doctrine of Human Automatism,' *Contemporary Review*, February 1875.
4. 'On the Hereditary Transmission of Acquired Psychical Habits,' same review, January and April 1873.
5. 'On the Physiological Import of Dr. Ferrier's Experimental Investigations into the Functions of the Brain.' Reports of the West Riding Asylum (Wakefield, Yorkshire), vol. iv., 1874.

XXIX. CASSELL'S 'Popular Natural History.' Abundantly illustrated; last edition in 2 vols.; crown 4to. London, 1871.

A compilation by various authors, illustrative of the Habits of Mammalia, Birds, Reptiles, Fishes and Insects.

XXX. CHADBOURNE, P. A., M.A., M.D., LL.D., President of the University of Wisconsin; formerly Professor of Natural History in Williams College, Williamstown, Conn., and of Natural History and Chemistry in Bowdoin College, New York.

1. 'Instinct: its office in the Animal Kingdom, and its relation to the Higher Powers in Man;' being the Lowell Lectures of 1871, delivered before the Lowell Institute, Boston; small 8vo. New York, 1872.
2. 'Lectures on Natural Theology,' delivered before the same Institute; small 8vo. New York, 1867.

XXXI. CHAMBERS, Messrs. W. and R., of Edinburgh, a well-known Scottish Publishing Firm.

1. 'Kindness to Animals; illustrated by Stories and Anecdotes; a Book for Home and School Reading,' compiled and partly written by William Chambers, of Glenormiston, formerly Lord Provost of Edinburgh; being a volume of the well-known 'Chambers's Educational Course.'

Not only does it give illustrative anecdotes in prose, and many tributes to animal virtues in verse, but it contains also a most useful and interesting account of—

a. 'Laws concerning Animals' and their Treatment in the United Kingdom.

b. The History and Doings of the 'Royal Society for the Prevention of Cruelty to Animals.'

c. The Operations of the 'Brown Institution,' and of the

d. 'Home for Lost and Starving Dogs,' both in the same suburb of London.

e. The Feats of the Truefitt Parrot (of Edinburgh), now dead.

f. The History of 'Greyfriars' Bobby,' (also of Edinburgh) and of the Public Honours conferred upon him.

If this is not also one of the most attractive, it is at least one of the most important of the admirable series of class books issued by the Messrs. Chambers, entitled to rank, for instance, with their valuable 'Moral Class Book.'

2. 'Chambers's Encyclopædia; a Dictionary of Universal Knowledge for the People,' edited by Andrew Findlater, M.A., LL.D.; 10 vols.; 8vo. Illustrated. 1860–8.

The articles on 'Mind,' 'Reason,' 'Instinct,' and allied subjects are by Prof. Bain, of Aberdeen; those on Human Idiocy and Insanity, by Dr. Browne, of Dumfries; some at least of those on Zoological subjects by the late Prof. Day, of St. Andrews; those on Veterinary Matters, by Prof. John Gamgee, formerly of the New Veterinary College, Edinburgh, and editor of the *Edinburgh Veterinary Review*.

Among other articles that deserve careful perusal are those on 'Cruelty to Animals;' 'Worship of Animals;' 'Fascination by Serpents;' 'Tame Animals;' 'Transmigration;' 'Consciousness;' 'Emotion;' Rabies; Hydrophobia; Dog, Horse, Elephant, Cat, Camel, Ant, Bee, Spider.

3. 'Chambers's Information for the People;' also illustrated; last edition, 1873–4.

Vol. i. contains articles on the Dog, Horse, Sheep, Honey Bee, on Cage Birds, Poultry, and other domesticated animals.

4. Chambers's 'Miscellany of Useful and Entertaining Tracts;' also illustrated; last edition, 1869–71.

Contains special numbers, sections or chapters, entitled:—

a. 'Select Poems on Birds.'
b. „ „ on Insects.'
c. 'Anecdotes of the Horse.'
d. „ of Dogs.'
e. „ of the Cat.'
f. Elephants.
g. Ants.
h. Spiders.
i. (Human) 'Children of the Wilds.'
j. 'Peter the Wild Boy.'
k. 'Victor—the Savage of Aveyron.'
l. 'Caspar Hauser.'
m. 'Mademoiselle Leblanc.'

5. 'Chambers's Journal;' a weekly serial.

Abounds in articles illustrative of the character and habits of the lower animals. Some of these articles are written by William Chambers, LL.D., F.R.S.E., present head of the firm which issues the works above-mentioned, and so many others that are known wherever English literature has penetrated; while other writers include men of standing as Clergymen, Medical Men, Naturalists, Travellers or Sportsmen.

A good illustration of the articles in question is the most instructive account given of a well-known Edinburgh parrot in the monthly part of the Journal for October 1874, under the title of 'The Talking Bird.' Possessing a different kind of interest are such papers as that on 'The (Human) Gesture Language in Southern Italy,' in the part for April 1871.

XXXII. CLAYTON, Captain:

'Scenes and Studies;' 8vo. London, 1870.

Contains a chapter on 'The possible Future Existence of the so-called Brute Creation.'

XXXIII. COBBE, Miss Frances Power, of London.

1. 'False Beasts and True; Essays on Natural and Unnatural History,' crown 8vo. A volume of 'The Country House Library.' London, 1875.

The chapters of which it consists originally appeared as review articles, viz.: that on

a. 'The Consciousness of Dogs' in the *Quarterly Review* for October 1872.

b. 'Dogs whom I have met,' in the *Cornhill Magazine* for December 1872.

c. 'Animals in Fable and Art,' in the *New Quarterly Magazine* for March 1874; and

d. 'The Fauna of Fancy,' in the same Magazine for October 1874.

2. 'Studies on Subjects New and Old, Ethical and Social;' consisting of a series of articles reprinted from *Fraser's Magazine*; post 8vo. London, 1865.

Contains a chapter on 'The Rights of Man and the Claims of Brutes.'

XXXIV. COMBE, the late George, of Edinburgh, the celebrated Phrenologist.

'System of Phrenology,' 2 vols.; 5th edition. Edinburgh, 1853.

Contains chapters or sections (in vol. ii.) on

a. 'Comparative Phrenology;' and

b. 'The Language of Animals.'

XXXV. COOPER, the late T. T., F.R.G.S., sometime H.B.M. political agent at Bhamo.

'The Mishmee Hills.' London, 1874.

XXXVI. CUMMING, Lieut.-Colonel Gordon.

'Wild Men and Wild Beasts.' Edinburgh; demy 4to. 1871.

Contains a chapter on the 'Intellectual and Moral Characteristics of the Wild Beasts of India.'

XXXVII. CUMMING, Miss Constance F. Gordon.

'From the Hebrides to the Himalayas,' 2 vols.; 8vo. Illustrated. London. 1876.

XXXVIII. CUNNINGHAM, Rob. O., M.D., Professor of Natural History in Queen's College, Belfast, and Naturalist to the Surveying Voyage of H.M.S. 'Nassau,' in 1866–9.

'Notes on the Natural History of the Strait of Magellan and West Coast of Patagonia;' 8vo. Illustrated. Edinburgh, 1871.

XXXIX. DARWIN, Charles, M.A., F.R.S., D.C.L.

1. 'The Descent of Man; and Selection in Relation to Sex.' Last edition (8th); crown 8vo. Illustrated. London, 1874.

Contains two chapters on the 'Mental Powers of Man and the Lower Animals,' instituting a comparison between them.

2. 'The Expression of the Emotions in Man and Animals;' last edition (10th); crown 8vo. Illustrated. London, 1874.

XL. DODGE, Lieut.-Col. Richard I., of the United States Army.

'The Hunting Grounds of the Great West; a description of the Plains, Game, and Indians of the Great North American Desert.' Illustrated. 8vo. London, 1877.

Quite as interesting as his description of the mental peculiarities of game animals is the account he gives of the low moral status of the Indians—the supposed 'Noble Red Men.'

XLI. DRUMMOND, The Honourable W. H.

'The Large Game and Natural History of South and South-east Africa;' large 8vo. Illustrated. Edinburgh, 1875.

XLII. EDWARDS, Professor Milne, of Paris.

'Manual of Zoology,' adopted by the Council of Public Instruction in France. English translation by the late Robert Knox, M.D., the celebrated Edinburgh Anatomist. London, 1856.

Contains a chapter on 'Intelligence and Instinct,' with a special section on the 'Faculties of the Understanding in Animals.'

XLIII. 'FIELD, THE,' a London weekly illustrated folio newspaper, edited successively by Walsh and Francis.

Abounds in articles and paragraphs illustrative of the mental peculiarities of the lower animals; especially of sporting dogs and horses, and of game animals—abroad and at home.

XLIV. 'FIELD QUARTERLY, Magazine and Review, The,' another folio serial, for some time published in London in connection with *The Field* newspaper, edited by Nichols. Only 3 vols. were issued.

Like *The Field*, it abounds in papers, but of a fuller and more scientific character, illustrating animal reason as contrasted with instinct.

XLV. FIGUIER, Louis, of Paris.

1. 'Primitive Man:' a popular account of the prevailing theories of the descent of man as promulgated by Darwin, Lyell, Sir John Lubbock, Huxley, E. B. Tylor, and other eminent Ethnologists.' Translated from the last French edition, and revised by Tylor; demy 8vo. London.
2. 'The Insect World,' 3rd English edition by Prof. Martin Duncan, F.R.S. London, 1872. Illustrated.

XLVI. FITTIS, Robert Scott, of Perth; a Scottish Novelist (author of 'Gilderoy'), but better known as a Scottish Historical and Antiquarian Littérateur.

'Historical and Traditionary Gleanings concerning Perthshire;' 8vo. Perth, 1876.

Contains two chapters on 'The Cat's Opera Man,' being a biography of Samuel Bisset, of Perth, the famous animal trainer of last century. An interesting general historical account is also given of the training of animals for the performance of feats before the public.

XLVII. FROST, Thomas:

1. 'The Old Showman and the Old London Fairs;' 8vo. London, 1874.

Contains biographical or other notices of—

a. Celebrated Animal Trainers; including—

b. Macomo, Macarthy, and other 'Lion Kings.'

c. Van Amburgh, Wombwell, Fairgrieve, and other menagerie proprietors, well known in Britain.

d. Jamrach, of London, and other noted dealers in foreign wild animals.

2. 'Circus Life and Circus Celebrities;' 8vo. London, 1875.

Contains many references to, or descriptions of, the feats of performing animals, especially the horse.

XLVIII. ROYAL GEOGRAPHICAL SOCIETY, Journal of the; a thick 8vo. volume issued annually for the last forty-eight years, its publication having been begun in 1830. Copiously illustrated with maps.

A perfect treasury of authentic accounts of the original exploration of new lands and islands; including a description of the mental status of primitive races of man in all quarters of the globe.

XLIX. GILBERT, William, the well-known English novelist.

'Man at His Lowest: Some Facts for Mr. Darwin,' *Day of Rest* for February 1875.

Compares performing monkeys with idiotic and deaf-mute children: especially in regard to the possession of a religious sense—'The Understanding of the Existence of a Deity.'

L. GILLIES, Robert, C. E., F.L.S., F.R.G.S., one of the Ex-Presidents of the Otago Institute, New Zealand.

'On the Habits of the Trap-door Spider;' illustrated. Transactions of the New Zealand Institute, vol. viii. (1876).

LI. GILLMORE, Capt. Parker, better known perhaps, as a traveller and sportsman, under his *nom de plume* 'Ubique.'

1. 'Prairie and Forest: a description of the Game of North America;' 8vo. Illustrated. London, 1874.

2. 'Prairie Farms and Prairie Folk,' 2 vols. Illustrated. Crown 8vo London, 1872.

LII. GOODSIR, the late Professor, of Edinburgh.

'Anatomical Memoirs,' 2 vols. Edinburgh, 1868.

Contains chapters on

a. 'The Nature of Animality.'

b. 'The Essence of Humanity;' and

c. 'Life and Organisation:' including a long and important note on 'Psychological Science.'

LIII. GREENWOOD, James, the well-known 'Amateur Casual' of the London press.

'In Strange Company;' the experiences of a Newspaper Correspondent, the newspaper being the London *Daily Telegraph*: 2nd ed.; crown 8vo. London, 1874.

Is of interest from very different points of view—

a. In so far as it represents graphically the human savagery, and the mental condition of the human savages, that exist in the midst of civilisation in England; both in the cities, such as London, and in the country, such as North Devonshire.

b. The chapter on 'The Art and Mystery of Song-Bird Torture,' shows the use made by man of the passions or propensities of the lower animals—of love, jealousy, rivalry and pugnacity; with their successful deception by man's imitations of their notes or calls, and by stuffed inanimate individuals of their own species.

LIV. HAMERTON, Philip Gilbert, editor of the 'Portfolio,' a well-known English artist and art-critic.

'Chapters on Animals.' Illustrated; 8vo. London, 1873.

LV. HAMLEY, Colonel E. Bruce, R.E.

'Our Poor Relations: a Philozoic Essay,' originally published in *Blackwood's Magazine* in 1870. Illustrated. 8vo. and 12mo. editions. Edinburgh, 1872.

LVI. HARTSHORNE, Bertram F., of the Indian Civil Service.

'The Weddas' of Ceylon; *Fortnightly Review*, March 1876.

LVII. HARTWIG, Dr. George, of Heidelberg, the well-known German Populariser of Natural Science.

1. 'The Sea and its Living Wonders,' translated from the fourth German edition. Illustrated. 8vo. London, 1860.
2. 'The Tropical World,' 8vo. Illustrated. London, 1863.

LVIII. HAYES, Isaac J., M.D., the well-known American Arctic Navigator.

'The Land of Desolation,' being a personal narrative of adventure in Greenland;' 8vo. Illustrated. London, 1871.

LIX. HELPS, the late Sir Arthur, K.C.B.

'Some Talk about Animals and their Masters,' 3rd edition; crown 8vo. London, 1874.

LX. HIBBERD, Shirley, of London.

1. 'The Moral Faculties of Brutes,' and—
2. 'What is Instinct?'

Papers in the *Intellectual Observer*, a London illustrated monthly, vol. iii., 1863.

LXI. HOGG, the late James, famous as a biographer, contemporary and friend of Sir Walter Scott, and otherwise in Scottish literature known as 'The Ettrick Shepherd.'

'Works of the Ettrick Shepherd: Tales and Sketches;' edited by the Rev. Thos. Thomson. Illustrated. London, 1866.

By far the most important chapter in relation to comparative psychology is that on 'The Shepherd's Dog,' in 'The Shepherd's Calendar,' which gives an account of the feats of his dogs 'Sirrah,' 'Hector,' 'Lion,' and others. The chapter on 'The Sheep' stands next in interest; while some of his 'Tales' include or embody authentic anecdotes of the sagacity of the dog; for instance, that entitled 'Duncan Campbell: story of a faithful Dog and neglected Child.'

LXII. HOLLAND, the late Sir Henry, M.D., F.R.S., of London.

1. 'Chapters on Mental Physiology,' 2nd edition. London.
2. 'Medical Notes and Reflections,' 3rd edition. London.

LXIII. HOUZEAU, J. C., Membre de l'Académie de Belgique and Director of the Royal Observatory of Brussels.

'Études sur les Facultés mentales des Animaux comparées à celles de l'Homme;' 2 vols.; 8vo. Mons (Belgium), 1872.

This important work, one of the most important that has ever been written on the subject of Comparative Psychology, was put together in Jamaica, where the author for a time resided. The materials on which it is based, however, were collected mainly in the wilds of Texas and Northern Mexico, where indeed the idea of the book seems to have suggested itself. The author modestly terms himself a 'Voyageur-Naturaliste,' and he is an excellent type of a class to which belong such men as Darwin, Huxley, Wallace, Bates, Bennett, and Belt. Like the works of these distinguished Naturalists, Houzeau's volumes are valuable as containing the facts and fruits of personal observation: in his case during six years' residence on the prairies of the 'Far West' of North America, where, as he himself

wrote me in 1873: 'I had to live in the open air, in the constant company of domestic animals, and in close proximity to wild ones.'

LXIV. HUME, the late David, the famous Scottish philosopher and historian.

'Inquiry concerning the Human Understanding,' 1752; or constituting vol. iv. of his 'Philosophical Works,' 1825.

Contains a chapter (ix.) 'On the Reason of Animals' which, however, is short and of little importance.

LXV. HUXLEY, Professor, of London, the celebrated Naturalist.

1. 'Evidence as to Man's Place in Nature;' 8vo. London, 1863.

Has a section (ii.) on 'The Relations of Man to the Lower Animals.'

2. 'The Hypothesis that Animals are Automata and its History:' an address at the British Association meeting in Belfast in August 1874; subsequently published in the *Fortnightly Review* for November 1874.

LXVI. IRELAND, Wm. W., M.D., Physician to the National Institution for Idiot Children at Larbert, Stirlingshire (Scotland): author of a standard treatise on 'Idiocy and Imbecility.'

1. 'An Inquiry into some accounts of Children being fostered by Wild Beasts:' referring to the so-called wolf-children of India. *Journal of Mental Science* for July and October 1874.

2. 'Report of some cases of Microcephalic Idiocy and Cretinism;' a reprint from the *Edinburgh Medical Journal* for August, September and October 1875.

LXVII. JAPP, Alex H.

'For Bird and Beast,' in *Good Words* for August 1874.

Gives an excellent history of the origin and development of the English 'Royal Society for the Prevention of Cruelty to Animals,' and of its organ, *The Animal World*, as well as of protective legislation in England.

LXVIII. JESSE, the late Edward.

1. 'Scenes and Occupations of Country Life, with Recollections of Natural History;' one of the volumes of 'The Golden Library;' square 16mo. London, 1875.

A new edition merely of his 'Scenes and Tales of Country Life,' small 8vo. 1845: in which re-issue he has been induced, he says, 'to add very considerably to that portion of it which comprised facts and circumstances in natural history, omitting the Tales of Country Life.' The book is dedicated to, as it was written for the use of, the young; and it is calculated, as it was intended—like so many other popular natural histories of the class to which belong such works as White's 'Selborne,' Buckland's 'Curiosities,' or Broderip's 'Recreations'—to create and stimulate in youth a love of animals, and of a study of their habits.

2. 'Gleanings in Natural History, with Anecdotes of the Sagacity and Instinct of Animals.' Last edition (11th) fcap. 8vo. Illustrated. London, 1872.

LXIX. JESSE, George R., of Henbury, Cheshire.

'Researches into the History of the British Dog, with Original Anecdotes and illustrations of the Nature and Attributes of the Dog;' two vols. illustrated, 8vo. London, 1866.

Chapter v. gives a synopsis of the mental attributes of the dog.

LXX. JOLY, Henri, Professeur à la Faculté des Lettres de Dijon (France).

'Psychologie comparée; L'Homme et l'Animal; ouvrage couronné par l'Académie des Sciences Morales et Politiques;' 8vo. Paris, 1877.

LXXI. KENNEDY, W. R., Capt. R.N., of H.M.S. 'Reindeer.'
'Sporting Adventures in the Pacific;' 8vo. illustrated. London, 1876.

LXXII. KIRBY, the late Rev. Wm., M.A., F.R.S.
'The Instincts, History, and Habits of Animals;' one of the 'Bridgewater Treatises:' edition by Professor Rymer Jones, F.R.S.; two vols. illustrated. London, 1853.

Vol. ii. contains a chapter on the general subject of 'Instinct.'

LXXIII. KIRBY, the late Rev. Wm., in association with the late Wm. SPENCE, F.R.S.
'Introduction to Entomology, or Elements of the Natural History of Insects;' 7th edition, crown 8vo. London, 1859.

Contains a special chapter on their 'Instinct,' by Spence.

LXXIV. KNOX, A. E., M.A., F.L.S., F.Z.S.
'Autumns on the Spey;' post 8vo. illustrated. London, 1872.

LXXV. KOLDEWEY, Capt.
'The German Arctic Expedition of 1869-70;' English edition by H. W. Bates, F.L.S.; 8vo. illustrated. London, 1874.

To the naturalist the most interesting chapter is that on 'Hunting, and Animal Life in East Greenland,' by Lieut. Payer and Dr. Copeland.

LXXVI. LAMONT, James, M.P., F.G.S., and F.R.G.S.
'Yachting in the Arctic Seas; Notes of Five Voyages of Sport and Discovery in the Neighbourhood of Spitzbergen and Novaya Zemlya.' Demy 8vo. illustrated. London, 1876.

LXXVII. 'LAND AND WATER,' a London weekly folio newspaper, similar to 'The Field,' to which it is a young and ambitious rival, and of which it may be considered an offshoot; edited by Frank Buckland, author of the 'Curiosities of Natural History' and other works.

LXXVIII. LAYCOCK, the late Professor, of Edinburgh.
'Psychological Inquiries:' a review in the *Journal of Psychological Medicine and Mental Pathology*;' vol. vii., 1854.

Contains references—as do others of the numerous psychological works, major and minor, of this author—to the subject of Community of Mind between Man and other animals.

LXXIX. LEE, Henry, F.L.S., F.Z.S., F.G.S., Naturalist of the Brighton Aquarium.
'The Octopus, or the Devil-Fish of Fiction and of Fact;' illustrated crown 8vo. London, 1875.

LXXX. VAN LENNEP, Rev. Dr. Henry J., a well-known American missionary in the East.
'Bible Lands: their Modern Customs and Manners;' illustrated 8vo. 2 vols. London, 1875.

LXXXI. LEROY, the late Charles Georges, one of the Rangers of the Forests of Versailles and Marly, near Paris, about the middle of last century.
'The Intelligence and Perfectibility of Animals from a philosophic point of view; with a few letters on Man;' post 8vo. London, 1870.

This appears to be a translation into English—with certain additional chapters—of a series of 'Lettres Philosophiques sur l'Intelligence des Animaux,' written originally under the *nom de plume* of 'The Naturalist of Nüremberg.'

LXXXII. LEVESON, the late Major H. A., of the Indian Army; long well known as a sportsman and writer on sport, under the name of H. A. L., 'The Old Shekarry.'

'Sport in Many Lands;' 2 vols. demy 8vo. copiously illustrated. London, 1877.

LXXXIII. LEWES, George Henry, Editor of the *Fortnightly Review*.

1. 'The Physiology of Common Life;' 2 vols. small 8vo. Edinburgh, 1859-60.

2. 'Problems of Life and Mind.' Vol. 1: demy 8vo. London, 1874.

LXXXIV. LINDSAY, Dr. Lauder, Physician to the Murray Royal Institution [for the Insane] near Perth, Scotland.

1. 'The Physiology and Pathology of Mind in the Lower Animals;' 8vo. pamphlet, printed for private circulation. Edinburgh, 1871.

Object: To show that, both in disease and health, mind in other animals exhibits the same kind of phenomena, possesses the same attributes, that it does in man. A mere outline, however, of the subject.

2. 'The Physiology of Mind in the Lower Animals;' *Journal of Mental Science* (London), for April, 1871.

Object: To show, more in detail, that the lower animals possess mind of the same character as that of man—liable to be affected by the same causes of derangement.

3. 'The Pathology of Mind in the Lower Animals;' *Journal of Mental Science* for April, 1877.

Object: To show that other animals are subject to the same (1) causes and (2) forms of *insanity* that affect man.

4. 'Insanity in the Lower Animals;' *British and Foreign Medico-Chirurgical Review* (London), for July, 1871.

Object: To illustrate the parallelism that exists between other animals and man as regards the kind of mental defect and disorder to which they are subject.

5. 'Madness in Animals;' *Journal of Mental Science* for July, 1871.

Object: To show that (1) much of the so-called *madness*—hitherto ascribed to rabies or hydrophobia—really belongs to the category of *insanity* as it occurs in man; while (2) genuine *rabies* or *hydrophobia* is a comparatively rare disease, whether in the dog or in man.

6. 'Mental Epidemics among the Lower Animals;' *Journal of Mental Science* for January, 1872.

Object: To show that the *panics* of certain animals are referable to the category of *epidemic mental disorders*, as they occur in man.

7. 'The Causes of Insanity in Arctic Countries;' *British and Foreign Medico-Chirurgical Review* for January, 1870.

Object: To show the equal influence of climate and its constituents, and of the peculiarities of Arctic life, in the production of mental disease in the dog and in man.

8. 'Community of Disease in Man and other Animals;' *British and Foreign Medico-Chirurgical Review* for January, 1874.

Object: To show that other animals are liable to the same kinds of cerebral, nervous, and other diseases as man; that certain of man's disorders—mental and nervous—are *artificially producible* in other animals; and that the *etiology* of disease—whether mental or bodily—is the same in other animals as in man.

9. 'The Transmission of Disease between Man and the Lower Animals;' *Edinburgh Veterinary Review and Annals of Comparative Pathology* for July, 1858.

Object: To show that various diseases are communicable from man to the lower animals, and *vice versâ*.

10. 'Experiments on the Communicability of Cholera to the Lower Animals;' *Edinburgh Medical and Surgical Journal*, April and October, 1854; and *Gazette Hebdomadaire de Médecine et de Chirurgie* (Paris), for November 24, 1854.

Object: To afford experimental proof that certain other animals are subject to the same kind of cholera, producible by the same causes, as in man; and that it is directly transmissible from man to them.

11. 'Choleraization in Animals;' *Lancet* (London), December 1, 1866.

Object: To demonstrate the means whereby cholera may be artificially produced in the lower animals; with the difficulties or fallacies of certain modes of experiment.

12. 'Clinical Notes on Cholera;' a series of papers in the *Association Medical Journal* (London), for 1854.

Contain observations on—

a. 'Epizootics in Domestic and Wild Animals.'

b. 'The Natural Influence of Cholera on the Lower Animals;' and

c. 'Diseases of the Lower Animals during Epidemic Cholera' (pp. 1110-1).

Object: To show the common influence of certain epidemic and endemic aërial and terrestrial poisons on other animals, as well as on man.

13. 'Suggestions for Observations on the Influence of Cholera and other Epidemic Poisons on the Lower Animals;' *Edinburgh Medical Journal* for July, 1857.

14. 'The Cattle Plague in some of its Aspects;' *Lancet*, May 16, 1857.

15 'The Toot-plant and Poison of New Zealand;' *British and Foreign Medico-Chirurgical Review* for July 1865, and October 1868.

Object: To show the equal influence on other animals, as well as on man, of certain narcotic poisons.

16. 'Belladonna as an Antidote to Opium in Animals;' and the 'Non-Susceptibility of certain of the Lower Animals to the Influence of certain Poisons;' *Association Medical Journal* for June 9, 1854.

Object: To show the idiosyncrasies of individuals, species, and genera of the lower animals in comparison with man, in relation to the action of poisons and their antidotes.

17. 'Microscopical and Chemical Characters of the Cholera Evacuations in Man and the Lower Animals;' illustrated by lithographs and wood-cuts; *Edinburgh Medical Journal* for February and March, 1856.

Object: To show the identity of human and animal cholera, and allied diseases, as regards their morbid anatomy.

Similar details are given in the sections treating of the vesical, gastric, and intestinal excretions or ejections in the 'Clinical Notes on Cholera,' already quoted (No. 12), which are also illustrated by wood engravings.

18. 'Illustrations of Animal Reason and its Derangements;' a series of papers in the 'Scottish Naturalist' for 1875 and 1876.

Object: To supply *authentic* anecdotes of animal sagacity, and to point out the difficulties of establishing the authenticity of published *anonymous* anecdotes.

19. 'Mind in Plants;' *Journal of Mental Science*, January, 1876.

Object: To show that certain carnivorous and other plants, in common with the lowest animals, exhibit certain phenomena of *purposive action* that are in man usually considered mental, or at least that are associated with current popular conceptions of mind.

20. 'The Artificial Production of Human Diseases in the Lower Animals;' a series of six papers in the *Lancet*, vol. i. for 1878.

Object: To show how readily certain mental, nervous, and other disorders of the same character as those of man are by him producible in other animals: and what is the kind or degree of his responsibility in the production of these *preventible* disorders.

21. 'Spurious Hydrophobia in Man:' *Journal of Mental Science* for January and April, 1878.

Object: To show the rarity of genuine hydrophobia: and the frequency of the spurious forms that are begotten of morbid imagination.

22. 'Spurious Hydrophobia in the Lower Animals:' *Journal of Mental Science* for January, 1879.

Object: To show the rarity of canine rabies: and the frequency of conditions that are confounded with and mistaken for it.

LXXXV. LIVINGSTONE, the late Dr. David, the famous African Missionary-Traveller.

'The Last Journals of David Livingstone in Central Africa;' by the Rev. Horace Waller, F.R.G.S., Rector of Twywell, Northamptonshire; 2 vols.: illustrated. London, 1874.

LXXXVI. LOW, Lieut., of H.M. Indian Navy.

'The Land of the Sun; Sketches of Travel;' 8vo. London, 1870.

Has a chapter on the 'Andaman Islands' and their inhabitants.

LXXXVII. LOW, The late Professor David, of Edinburgh, an eminent writer on agricultural science and practice.

'The Domesticated Animals of the British Islands;' 8vo. Edinburgh, 1845.

LXXXVIII. LUBBOCK, Sir John, Bart., M.P., D.C.L., F.R.S., F.L.S., Vice-Chancellor of the University of London.

1. 'The Origin of Civilisation and the Primitive Condition of Man; the Mental and Social Condition of Savages;' 3rd ed.; 8vo. Illustrated. London, 1874.
2. 'The Social and Religious Condition of the Lower Races of Man.' Report of the Smithsonian Institution (Washington, U.S.A.), for 1869.
3. Several series of Experimental Observations on the Habits of Ants, Bees, and Wasps. *Journal of Linnean Society* (Zoology), 1874—1878; *Nature*, 1874—1878; and *Fortnightly Review*, 1877.

LXXXIX. MACAULAY, James, M.A., M.D., editor of the *Leisure Hour*.

'A Plea for Mercy to Animals.' One of the publications of the 'Religious Tract Society.' Imperial 16mo. London, 1875.

XC. MACGAHAN, the late J. A.: Eastern correspondent of the *New York Herald*.

'Under the Northern Lights,' a narrative of the Arctic cruise of the *Pandora* steam yacht in 1875. Illustrated; 8vo. London, 1876.

Contains chapters on (*a.*) 'Our Dumb Companions,' the shipboard pets of sailors; (*b.*) 'A Tragedy,' which gives the history of a leader Eskimo dog

that, being brought to England, betook itself to the woods of Hampshire, and was shot there as a supposed 'wolf;' and (*c.*) 'A Pet Bear.'

XCI. MACKELLAR, Mrs. Mary, of Edinburgh, a Highland poetess, of whose life and labours a notice is given by Professor Blackie in his 'Language and Literature of the Scottish Highlands.'

As the wife of a ship captain she has travelled a great deal, and has made the best use of her opportunities of observation, equally abroad and at home.

Letters on 'The Reasoning Powers of Animals,' in the *North British Advertiser and Ladies' Journal*,' one of the best known newspapers of Edinburgh—for January 1875.

As a weekly serial this newspaper has always been honourably distinguished for its literary character; and, while containing original articles, such as those of Mrs. Mackellar and Miss Clara Rossiter, it also abounds in quotations from all current sources illustrating the sagacity of animals.

XCII. MAUDSLEY, Professor, of University College, London, lately editor of the *Journal of Mental Science*, a well-known quarterly.

1. 'The Genesis of Mind;' *Journal of Mental Science* for January and April, 1862.
2. 'Body and Mind;' crown; 8vo. London, 1870.

Originally a series of 'Gulstonian Lectures on the relations between body and mind, and between mental and other disorders of the nervous system,' delivered at the Royal College of Physicians, London.

XCIII. MENAULT, the late Ernest, of Paris.

1. 'Wonders of Animal Instinct;' 8vo. London, 1872.
2. 'The Intelligence of Animals,' with illustrative anecdotes. Translated from the French; 8vo. Illustrated. London, 1869.

XCIV. MOGGRIDGE, the late J. Traherne, F.L.S., of Mentone, France.

'Harvesting Ants and Trap-door Spiders; Notes and Observations on their Habits and Dwellings;' 8vo. Illustrated. London, 1873. With a 'supplement' published in 1874.

XCV. MONTAGU, the late Colonel George, a Devonshire sportsman-naturalist, who has been held in the highest esteem by successive generations of British naturalists.

'Dictionary of British Birds,' edited by the late Edward Newman, F.L.S., F.Z.S., editor of the *Zoologist*; 8vo. London, 1866.

Originally published in 1802 and 1813 as the 'Ornithological Dictionary.'

XCVI. MONTEIRO, the late Joachim John, Associate of the School of Mines, London, and Corresponding Member of the Zoological Society of London; a competent Portuguese traveller-naturalist, long resident in Western Tropical Africa.

'Angola and the River Congo;' 2 vols. 8vo. Illustrated. London, 1875.

XCVII. MÜLLER, Professor Max, of Oxford, the distinguished philologist.

1. 'Lectures on Darwin's Philosophy of Language.' *Fraser's Magazine* for 1873, and *Contemporary Review* for 1875.
2. 'Résumé of all that is known of Indian Wolf-children.' *Academy* for November, 1874, and *Journal of Mental Science* for January, 1875.

XCVIII. MURRAY, the late Andrew, F.R.S.E., F.L.S., of London, the eminent entomologist.

'Geographical Distribution of Mammals;' 4to.; copiously illustrated by coloured maps. London, 1866.

XCIX. 'NATURE,' an illustrated London weekly magazine, edited by J. N. Lockyer, F.R.S., the well-known astronomer; assisted by sub-editors in the various departments of natural science.

Is under the patronage of the most advanced naturalists of the day, and abounds in well-authenticated illustrations of animal reason.

C. NEW, the late Rev. Charles, of the Livingstone Search and Relief Expedition of 1872.

'Life, Wanderings and Labours in Eastern Africa;' 8vo. Illustrated. London, 1873.

CI. NICHOLS, Arthur, F.R.G.S., formerly editor of the 'Field Quarterly Magazine and Review,' who has had much experience of bush life and bush animals in Australia.

'Do Animals think?' a series of articles in the said *Field Quarterly* for February, August, and November, 1872.

CII. 'PERCY ANECDOTES,' the: Chandos edition by Timbs, in 2 vols.; 8vo. London, 1868.

Contains a special section entitled 'Anecdotes of Instinct,' illustrating a considerable variety of the mental aptitudes of the lower animals.

CIII. PIERQUIN, the late Dr., physician to the Charité Hospital, Paris.

'Traité de la Folie des Animaux, de ses Rapports avec celle de l'Homme;' 2 vols. 8vo. Paris, 1839.

An important work, far in advance of its day, and even yet not known and appreciated as it well deserves to be. It contains chapters treating of such subjects as—

a. The history of the development of the science of comparative psychology.

b. The moral sentiments of animals.

c. The physical signs or expressions of passion, emotion, and intelligence.

The work abounds, moreover, in anecdotes—from classical times downwards—illustrative of animal sagacity.

CIV. POMPELLY, Professor, of Harvard College, Cambridge, Mass. (U.S.A.).

'Across America and Asia;' 8vo. London, 1870.

CV. POTTS, Thomas H., F.L.S., of Canterbury, New Zealand.

A series of papers illustrative of the habits of the birds of New Zealand, published in the Transactions of the New Zealand Institute; an annual illustrated 8vo. volume, printed in Wellington, New Zealand.

CVI. POUCHET, the late F. A., M.D., Corresponding Member of the Institute of France, and Director of the Museum of Natural History, Rouen.

'The Universe; or the Infinitely Great and the Infinitely Little;' 4th English edition, copiously illustrated. London, 1876.

Contains chapters on 'The Intelligence of Insects.'

CVII. PREJEVALSKY, Lieut.-Colonel N., of the Russian Staff Corps, and Member of the Imperial Russian Geographical Society.

'Mongolia, the Tongut Country, and the Solitudes of Northern Tibet; being a Narrative of Three Years' Travel in Eastern High Asia.'

Translated from the Russian by E. Delmar Morgan, F.R.G.S., with introduction and notes by Colonel Henry Yule, C.B., R.E.; 2 vols. 8vo. Illustrated. London, 1876.

CVIII. RAMSAY, the late Sir George, of Bamff, Bart.

'Instinct and Reason; or the First Principles of Human Knowledge.' Post 8vo. London, 1862.

Has only one short chapter (of three pages) on 'The Reason of Animals.'

CIX. ROMANES, George J., M.A., F.L.S.

1. 'Instinct and Acquisition,' and other contributions to comparative psychology in *Nature*.

2. 'Conscience in Animals.' *Quarterly Journal of Science*, April 1876.

CX. ROSSITER, Clara.

'Anecdotes of Pets,' relating to the Cat and other animals, in the *North British Advertiser* (of Edinburgh), for 1874.

CXI. SCHEVE, Gustav, of Dresden.

'Phrenologische Bilder;' 8vo. Leipsic, 1851.

Contains a chapter 'Der Mensch und das Thier,' pointing out the psychological resemblances and differences between man and other animals.

CXII. SCHWEINFURTH, Dr. Georg, an accomplished German botanical traveller.

'The Heart of Africa;' 2nd English edition. Illustrated. 2 vols.; 8vo. London, 1874.

CXIII. 'SCIENCE GOSSIP,' Hardwicke's; 'an illustrated medium of interchange and gossip for students and lovers of nature.' A London monthly journal of natural history of a thoroughly popular character; formerly edited by Dr. Cooke, the eminent fungologist, now by Dr. Taylor, F.G.S., of the Ipswich Museum.

CXIV. SMILES, Samuel, now of London, formerly a Scotch country surgeon.

'Life of a Scotch Naturalist: Thomas Edward, A.L.S.,' curator of the Museum, Banff. Illustrated 8vo. 3rd edition. London, 1877.

The valuable part of the work, in connection with our subject, is Edward's own description of the habits of wild birds.

CXV. SMITH, the late Rev. Sydney, the famous English humourist or wit.

'Elementary Sketches of Moral Philosophy,' 8vo. London, 1850.

Contains two chapters on 'The Faculties of Beasts,' as compared with those of man.

CXVI. SMITHSONIAN INSTITUTION, Washington, U.S.A., Annual Reports of the Board of Regents of the; begun in 1847, and continued up to the present date.

These annual volumes abound in papers illustrative of the manners and customs—which embrace the moral and religious condition, the psychical status—of the aborigines of many different parts of North America; papers that are particularly valuable as showing the negative or defective character, especially as to morals and religion, of many native races.

Nor are these reports less valuable from containing, besides, the results of the researches of the most eminent British anthropologists, such as those of Lubbock and Tylor [e.g., the volumes for 1867 and 1869].

CXVII. SOUTHESK, the Earl of, Kt., F.R.G.S.

'Saskatchewan and the Rocky Mountains: a Diary and Narrative of Travel, Sport, and Adventure during a Journey through the Hudson's Bay Company's Territories in 1859 and 1860,' 8vo. Illustrated. London, 1875.

CXVIII. SPALDING, the late Douglas A., of the Middle Temple, barrister-at-law, London.

1. 'Instinct, with Original Observations on Young Animals.' *Macmillan's Magazine* for 1873.
2. 'Instinct and Acquisition.' *Nature* for 1875.

CXIX. SPENCER, Herbert, the eminent English psychologist.

'Principles of Psychology;' 2nd ed. 8vo. London, 1872.

CXX. THOMPSON, Edw. P.

1. 'Note Book of a Naturalist,' 8vo. London, 1845.

These Notes of a Traveller-naturalist in Europe embody chapters on the

a. Physiognomy,
b. Character; and
c. Passions,
} of the lower animals in general, and on what is specially called

d. Instinct—in dogs.

2. 'The Passions of Animals,' 8vo. London, 1851.

An unfortunate title for a book that is an excellent compilation, including as it does, such subjects as Imagination, Dreams, and Mistakes.

Refers to the 'Andeutungen aus dem Seelenleben der Thiere,' of Dr. Schmarda, on which indeed Thompson's volume seems to be based.

CXXI. TYLOR, Edward B., LL.D., F.R.S.

1. 'Researches into the Early History of Mankind, and the Development of Civilisation.' 2nd. ed.; 8vo. London, 1870.
2. 'Primitive culture: Researches into the Development of Mythology, Philosophy, Religion, Language, Art and Custom.' 2nd ed.; 2 vols. 8vo. London, 1874.
3. 'Wild-men and Beast-children.' *Anthropological Review*, vol. i. 1863.
4. 'On Traces of the early Mental Condition of Man.' *Report of the Smithsonian Institution, U.S.A. for* 1867.

CXXII. VERNEY, Lady.

1. 'Bees in the Past and the Present.' *Good Words* for 1873.
2. 'Monkeys.' *Good Words* for 1875.

CXXIII. 'VESTIGES of the Natural History of Creation.' 11th ed. (which is the last); illustrated. London, 1860.

Contains a chapter on 'The Mental Constitution of Animals:' regarded from a phrenological point of view.

CXXIV. VINCENT, Frank, Junr., an American Traveller.

'The Land of the White Elephant,' a Record of Travel in 1871-2, in Burma, Siam, Cambodia and Cochin-China.' 8vo. Illustrated. London, 1873.

CXXV. WALLACE, Alfred R., F.R.S., F.L.S.

1. 'Contributions to the Theory of Natural Selection.' Crown 8vo. London, 1870.

Contains a chapter on the 'Intellect of Savages and of Animals compared.'

2. 'The Malay Archipelago: the land of the Orang-utan and the Bird of Paradise: a Narrative of Travel, with Studies of Man and Nature.' 5th ed. crown 8vo. Illustrated. London, 1872.
3. 'Introduction to a Catalogue of the Aculeate Hymenoptera and Ichneumonidæ of India and the Eastern Archipelago.' *Journal of Linnean Society, Zoology*, vol. xi. 1873.

CXXVI. WARBURTON, Colonel P. E., Companion of the Order of St. Michael and St. George, formerly of the Bombay Army, and now of Adelaide, South Australia.

'Journey across the Western Interior of Australia.' 8vo. Illustrated. London, 1875.

CXXVII. WARDROP, The Rev. John, U. P. Minister of Craigend, near Perth (Scotland).

'Animal Psychosis:' a series of Papers in the *Scottish Naturalist* for 1875 and 1876.

Regards from a metaphysician's and theologian's point of view what he believes to be the specific diversity of mental phenomena in man as compared with other animals.

CXXVIII. WATSON, The Rev. J. S., M.A.

'The Reasoning Power in Animals.' 8vo. London, 1870.

Many of the anecdotes given are hackneyed, and require confirmation, or rather replacement by others of more modern date and of a more precise kind.

CXXIX. WESTWOOD, Professor J. O., F.L.S., of Oxford.

'Introduction to the Modern Classification of Insects.' 2 vols. 8vo. London, 1840.

The more specially interesting sections are those which treat of the Habits of Bees, Ants and Wasps.

CXXX. WHETHAM, J. W. Boddam.

'Pearls of the Pacific.' Being a Narrative of Travel in the Sandwich, Samoan, Fiji and other Polynesian Islands. Demy 8vo. Illustrated. London, 1876.

CXXXI. WHITE, Adam, F.L.S., late of the Zoological Department of the British Museum, London.

'Popular History of Mammalia.' One of Lovel Reeve's series of illustrated popular Natural Histories. London, 1850.

CXXXII. WHITE, the late Rev. Gilbert, M.A., of Selborne.

'The Natural History of Selborne.' Edited by the late Sir Wm. Jardine, of Applegarth, Bart., editor of the well-known 'Naturalist's Library,' and by the late Edward Jesse, author of the 'Gleanings,' and other works in Natural History: containing numerous notes by the editors and other distinguished naturalists. One of the volumes of 'Bohn's Illustrated Library.' 8vo. London, 1851.

Especially valuable as an example of what may be accomplished by country clergymen or doctors in the scientific observation and record of Natural Phenomena.

CXXXIII. WOOD, The Rev. J. G., M.A., F.L.S.

'Man and Beast, Here and Hereafter, with illustrative Anecdotes.' 2nd ed. post 8vo. London, 1876.

The Anecdotes, which are said to be original and modern, amount to upwards of 300, 'all being authenticated by the writers, and the documents themselves remaining in my possession,' says the author. Many of the anecdotes in question, however, are certainly neither original nor modern. Not a few I have met with in different forms in books of very different characters and dates, and the probability, therefore, is that not a few of his correspondents have drawn upon their memory and imagination, and have reproduced, unwittingly, no doubt, various 'old stories' sometimes of little or no value.

The want of an INDEX is a serious defect in this and certain other similar volumes that treat of Animal Intelligence.

ENUMERATION OF ANIMALS.

Enumeration of the Animals whose Character and Habits form the Basis of the Author's Generalisations.

The following catalogue is the result of the conviction that it is desirable to show the exact nature, variety and extent of the *bases* on which the generalisations contained in the body of this work are founded. In general terms and in round numbers it may safely be affirmed that the conclusions referred to have been based on the character and habits of about 1,250 animal species, representing—though necessarily unequally—all zoological classes and orders, from the Protozoa up to the Quadrumana. Of these species I have been able *seriatim* to catalogue only 930; while, in the case of at least 300 others, the *species*, for various reasons immediately hereinafter to be described or explained, have been indeterminable. Of the 300 indeterminable species about 100 are birds, another 100 insects, while the third hundred are mammals, fish, or other animals.

The appended catalogue has involved an immense amount of labour—incommensurate, perhaps, with the result; much of it fruitless, unrepresented and unrepresentable. I can honestly affirm, indeed, that the compilation of this section of the Appendix has cost me infinitely more trouble—comparatively—than the other investigations on which the body of this book has been based; while, notwithstanding all the pains bestowed, it cannot be considered accurate, complete or satisfactory.

The catalogue makes no pretence to be regarded as exhaustive or even precise. I had no sooner begun to draw it up in the form in which it appeared desirable to present it to the general reader, than I found insuperable difficulties in rendering it at all complete, on the one hand, or accurate on the other. As a warning to future

writers—of whatever kind—on the mental endowments of animals, I do not think it a waste either of time or space to point out shortly the nature and causes of the chief difficulties so encountered.

I. The use by authors of all kinds only of what is, or is supposed to be, the *common English name* of the animal, whose habits form the subject of their comments; a designation frequently so vague that it may embrace not only *many species*, but many genera and even orders. Thus, when a writer describes the habits of an *ant* in this or that country, without giving its scientific or zoological name, we are at a loss to determine to what one of many species and genera, or even, perhaps, to which of two orders, the animal belongs; for while the *true ants* belong to the extensive and important order of the *Hymenoptera*—which includes also bees and wasps—the *white ants* belong to the smaller and less important order of the *Neuroptera*. The consequence, then, of numerous authors speaking simply of 'ants' instead of designating the genus and species, is this, in so far as concerns such a table as ours,—that the said table omits all the instances in which the generic and specific names are not supplied; in other words, in this single category of ants, the *omissions* are infinitely more numerous than the species scheduled.

The number and variety of both genera and species that may be included in a single general common English name may be illustrated by such cases as these: among

1. *Cœlenterata*—sea anemones.
2. *Annuloida*—starfish, hydatids.
3. *Annulosa*—spiders, worms, crabs.
4. *Insects*—bees, wasps, beetles, butterflies, moths, flies.
5. *Mollusca*—snails, slugs.
6. *Fish*—sharks, salmon, rays.
7. *Amphibia*—frogs.
8. *Reptiles*—serpents, snakes, vipers, boas, lizards, tortoises. and turtles.
9. *Birds*—waterfowl, sparrows, albatrosses, ducks, vultures. kingfishers, pigeons and doves, crows, gulls, parrots and parroquets, eagles, falcons and hawks, grouse, larks, thrushes, owls, swallows, swifts and martins, partridges and pheasants.
10. *Mammals*—apes, monkeys, baboons and gibbons, deer, antelopes and goats, rats and mice, whales and seals, bears, bats, marmots.

Ignoring then the fact that the *same common English name* may and does refer, in different localities or countries, frequently to

different species and genera, it is a serious error of omission in those authors who give themselves no trouble to ascertain and record, along with their observations or comments, the *Latin name* of the species whose habits they are describing. It is only by the use of these convenient binomials that the animals referred to can be identified by readers, even if they be naturalists, of different nationalities.

In the case of such animals as the dog, horse, ass, mule, sheep, cattle or common fowls, comparatively little harm is done by the omission of the Latin or scientific name of the species; because, as a rule, there is a single genus with few species, and the circumstances of the animal's life, when these are recorded, its native country, its being domestic, tame, captive or wild, will or may lead the experienced naturalist to the determination of the species. But not necessarily; for under the heads of dog and sheep, for instance, in the following catalogue, I have retained some of the old sub-specific names that are still considered distinctive. Even when we know both genus and species, such a general designation as *dog* leaves us in ignorance of the *breed*—a matter of moment to the Comparative Psychologist, considering the remarkable psychical differences that so frequently characterise both breeds and individuals.

II. The exclusive use of *other classes of popular names*—whether colonial, native or foreign; designations that are just as vague and objectionable when standing alone as common English designations.

III. The *non-use of the Latin*, scientific or zoological, specific and generic *name* of every animal. With the exception of scientific traveller-naturalists, of the class represented by Darwin, Wallace, Houzeau, and Belt, there are very few authors of any kind who give the modern or current Latin names of the animals whose character they portray.

It so happens that, in certain cases, the proper scientific name cannot yet be assigned, because the animals described by travellers have not yet been examined by zoological experts. And this is the case unfortunately with certain animals of the highest interest in a psychological point of view—for instance, in that of the *Soko* of central tropical Africa, mentioned by Livingstone in his "Last Journals," and which is probably a species of *Troglodytes*—a gorilla or chimpanzee.

Unfortunately, most writers are equally careless in giving the other, obviously very necessary, details specified in the other columns of the following table.

IV. Where Latin names are given they have sometimes been

borrowed second-hand from a succession of popular writers, and are hence *old and obsolete*. In which case it is only the accomplished zoological specialist, versed in the superabundant literature of his subject, who can correctly assign the proper modern designation or synonymy.

V. Moreover, we have constantly to encounter in popular works on Natural History egregious *mis-spellings* by writers obviously equally ignorant of Latin and Zoology—including, for instance, an utter disregard of any agreement as to gender between substantive and adjective. A defective Latinity in book-writers, even of a scientific class, is a fertile source of sometimes gross errors in zoological nomenclature.

VI. The incessant *changes* that are taking place in *zoological nomenclature and classification*. This continuous and perplexing changeability arises from or is connected with—

a. The prevalent love of novelty and fashion both in names, in name-giving, and in systems of arrangement.

b. The mania for elaborate species-making and splitting, and the consequent multiplication of unnecessary names.

c. The much greater attention given to the discrimination of trivial differences than to the discovery of broad or general resemblances.

d. The capricious conversion of varieties into species or *vice versâ*; the finical sub-division of genera; the transfer and re-transfer of genera from one order into another.

No doubt changes—both in nomenclature and classification—may be and are rendered necessary by the rapid acquisitions of zoology—by the numerous additions that are constantly being made from all parts of the world—to those 'new species' in which zoological systematists so greatly delight. But changes that are necessary and desirable, that are the natural or legitimate fruit of accepted additions to zoological knowledge, are to be carefully distinguished, if it be possible to do so, from those that are neither necessary nor desirable—that are, in short, attributable to mere zoological dogmatism, caprice, novelty or fashion. The convenient doctrine of necessary change will not account for all the numerous instances in which the name of some single common species of animal is involved in a complex and puzzling *synonymy*, in which a single well-known animal has become the unfortunate subject of two or three dozen very different but equally curious Latinised designations.

In endeavouring to determine the *species* of animal whose habits are described by such writers as those whose works are

enumerated in the *Bibliography*, and to fill up the other details given in the following catalogue, it became necessary for me, in the absence of scientific libraries or books in a provincial town and in a country residence, every now and again to have recourse to the assistance of zoological specialists in different parts of the three kingdoms. To all of these gentlemen I am under obligations for the readiness with which they consulted works of reference on my behalf. But my acknowledgments are specially due to Prof. Alfred Newton, of Cambridge; Prof. Macalister, of Dublin; and Dr. Buchanan White, editor of the *Scottish Naturalist*, for the pains they took in supplying me with as full information as was under the circumstances procurable.

Among other advantages of such catalogues as the following is this—that they exhibit the number of animals whose *specific designations* have been based wholly or partly on their *mental qualities*. Illustrations are to be found in—

Canis sagax.
C. latrans.
Passer stultus.
Megalopterus stolidus.
Lepus timidus.
Galeodes intrepida.
Macropodus, Machetes, and Semipodius pugnax.
Ursus ferox.
Atta providens.
A. agricola.
Arvicola economica.
Formica indefessa.
Termes bellicosus.
Eciton prædator.
Pheidole plagiaria.
Birgus latro.
Bufo obstetricans.
Mimus polyglottus.

Most or all of these specific designations—based on *psychical peculiarities*—are at least quite as appropriate and descriptive as the term *sapiens* applied to the single known representative of the genus *Homo*.

It is a pity that a much larger number of animal species have not derived their distinctive appellations rather from marked *psychical characters* than from those that are obscure, variable and physical. In other words—mental features, powers or endowments, might very appropriately form to a greater degree than at present *specific characters* in zoological nomenclature and classification; mind, where it is conspicuously exhibited, might itself become or furnish a zoological *character* in systematic diagnosis and arrangement.

I. Enumeration of Species: with their leading Varieties, Breeds or Races.

In the last column the letter W. signifies *wild* animals—in a state of Nature; S-W. those which are *semi-wild*; T. those that are *tame*—as pets; D. those that are *domesticated*; and C. those that are *captive* or in confinement—as in public menageries or parlour cages.

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1. Agama, Frilled	Agama chlamydosaurus	Lacertilia	Australia	W.
2. Agami, or Gold-breasted Trumpeter	Psophia crepitans	Grallatores	Tropical S. America, and England	T. W.
3. Agouti	Dasyprocta agouti	Rodentia	W. Indies and S. America	T.
4. Albatross, Wandering	Diomedea exulans	Natatores	New Zealand	W.
5. „ Black eye-browed	D. melanophrys	„	„	W. C. T.
6. Alligator	Alligator Mississippensis	Crocodilia	S. United States of America	W.
7. Alpaca, or Paco	Auchenia Paco	Ungulata	S. America	W. T. D.
8. Anemone, Cloak	Adamsia palliata	Actinozoa	England	W. C.
9. „ Common Sea	Actinia mesembryanthemum	„	„	C.
10. „	A. crassinervis			
11. Angel Fish, or Monk Fish (a shark)	Squatina Angelus	Plagiostomi	„	„
12. Angler Fish, Fishing Frog, Sea Devil, the 'Wide-gab' of Scotland	Lophius piscatorius	Acanthopteri	Britain	W. C.
13. Animalcule, Common Sun	Actinophrys Sol	Rhizopoda	„	„
14. „ Proteus	Amœba radiosa	„	„	„
ANTS I. True.				
15. Ants, Harvesting or Provident	Atta structor	Hymenoptera	S. of France, and the Riviera	„
16.	A. megacephala			
17.	A. barbara			
18.	A. providens	„	India	W.

19.	Ants, Agricultural	A. agricola	„	Texas	„
20.		Myrmica molefaciens	„	„	„
21.	„ Army or Foraging	Eciton prædator	„	Nicaragua	„
22.		E. hamata	„	„	„
23.	„ Honey-making	Myrmecocystus Mexicanus	„	Texas and New Mexico	„
24.	„ Leaf-cutting	Pseudomyrma bicolor	„	Nicaragua	„
25.	„ Visiting	Atta cephalotes	„	S. America (Surinam)	„
26.	„ House, or 'Mad' (the 'Summut gila') of the Malays	Tapinoma glabrata	„	India	„
27.	„ Indefatigable	Formica indefessa	„	Malacca	„
28.	„ Sugar Cane	F. saccharivora	„	Antilles (Grenada)	„
29.	„ Common large red, Hill or Wood	F. rufa	„	England	„
30.	„ Yellow	F. flava	„	Britain and Switzerland	„
31.	„ Brown	F. fusca	„	Britain	W. C.
32.	„ Black or Garden	F. nigra	„	Britain and France	„
33.	„ Redbeard	F. rufibarbis	„	Switzerland	W.
34.	„ Emmet or Jet	F. fuliginosa	„	Britain, Italy, and Switzerland	„
35.	„ Amazon	F. rufescens	„	Switzerland	„
36.	„	F. sanguinea	„	England	„
	ANTS II. True.				
37.	Species having no common English or other designations	F. quadriceps	„	Aru Islands	„
38.		F. pubescens	„	Italy	„
39.		F. pratensis	„	Switzerland	„
40.		F. ligniperda	„	England	W. C.
41.		Pheidole pabulator	„	Island of Ba'chian	W.
42.		P. plagiaria	„	„	„
43.		Myrmica palcata	„	Brazil	„
44.		M. erythrothorax	„	„	„
45.		M. rubra	„	Britain	„
46.		M. ruginodis	„	England	W. C.
47.		Solenopsis laboriosa	„	Island of Batchian	W.
48.		Œcophylla smaragdina		India and Indian Archipelago	„

ENUMERATION OF SPECIES—*continued.*

I. Common Name, including the English, Colonial, Native, Foreign, or other popular designation.	II. Scientific, Latin, or Zoological Name of Genus and Species	III. Zoological Class or Order	IV. Country in which Habits observed, including that in which animals are captive or domesticated	V. Circumstances under which Habits observed
ANTS III. White				
49.	Termes arborum . .	Neuroptera. .	W. and Central Tropical Africa . . .	W.
50.	T. bellicosus . . .			
51.	T. lucifugus . . .	,, . .	S. France	,,
52. Ant-eater, Cape, Earth or Ground Hog ('Hard or haard-vark') of the Dutch Colonists .	Orycteropus Capensis . .	Edentata . .	S. Africa	,,
53. ,, Great, or Tamandua . . .	Myrmecophaga jubata . .	,, . .	S. America . . .	,,
54. Ant-lion	Myrmeleon formicarium . .	Neuroptera .	S. Europe and Gold Coast of Africa . .	,,
55. Antelope, Prong-horned, or the Prong-horn .	Antilope furcifer . . .	Ungulata . .	N. America . . .	,,
56. ,, 'Ovongo' of the Mongols and Tanjutans	A. Hodgsoni	,, . .	Tibet	,,
57. ,, Little or 'Atadzeren' of the Mongols	A. picticauda	,, . .	N. Tibet	,,
58. ,, ...	Damalis Senegalensis . .	,, . .	Central Africa (Nile region)	,,
59. Ape, Gibraltar, Barbary or Pigmy, the Magot .	Simia sylvanus . . .	Catarrhina .	Gibraltar, N. Africa and Britain . . .	W. S-W. C.
60. ,, Bawian . . .	Cercopithecus Kees . .	,, . .	Africa	W. T.
61. ,, Senegal . . .	C. sabæus	,, . .	W. Tropical Africa (Senegal), and Cape Verde Islands . .	W.

62.	Archer Fishes	Chætodon rostratus	Acanthopteri	India and Java	W.
63.		Toxotes jaculator	„	Java and the Indian Archipelago	W.
64.		Sparus indicator	„	N. Atlantic	„
65.	Asp, Aspic, or Egyptian Cobra	Naja haje	Ophidia	Egypt, Cyprus and Syria	W. T.
66.	Ass, Common or Domestic, the Donkey	Equus Asinus	Ungulata	England, Switzerland, Syria, Palestine, NE. Africa	D. T.
67.	„ Wild, or 'Ghorkur'	E. onager	„	NW. India	W.
68.	Aye-aye	Cheiromys Madagascariensis	Strepsirrhina	Madagascar and France	T.
69.	Baboon, Common, or 'Derriah'	Cynocephalus hamadryas	Catarrhina	Abyssinia and Egypt	W. T.
70.	„ Cape, Pigfaced or Ursine, the 'Chacma' (or Chack-Kama)	C. porcarius	„	S. Africa	W. T. C.
71.	„ Drill	C. leucophæus	„	W. Africa and Germany	W. C.
72.	„	C. Babouin	„	Germany	C.
73.	„	C. Sphinx	„	„	„
74.	Badger, Common, the 'Brock' of Scotland	Meles taxus	Carnivora	Britain	W. T.
75.	Barnacle or Bernicle	Lepas anatifera	Cirripedia	„	W. C.
76.	Basilisk, Crested	Basilius Amboinensis	Lacertilia	Indian Archipelago	W.
77.	Bear, Common Brown	Ursus arctos	Carnivora	N. Europe and Asia	„
78.	„ Arctic, Polar, or White	U. maritimus	„	Arctic America and Asia	W. C. T.
79.	„ American Black	U. americanus	„	New Brunswick	„
80.	„ Mountain or Grizzly	U. ferox	„	N. America (New Mexico)	W.
81.	„ Syrian	U. Syriacus	„	Syria	„
82.	„ Malayan Sun	U. Malayanus	„	Malay Peninsula	T.
83.	„ Sloth, Labiated or Long-lipped	Ursus labiatus	„	India and Ceylon	„
84.	„ Peruvian	Saimuris entomophagus	„	Peru	W.
85.	Beaver, Old world	Castor fiber	Rodentia	N. Europe and Asia	W. C. T.

ENUMERATION OF SPECIES —*continued.*

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86. Beaver, American	Castor Canadensis	Rodentia	N. America	W. C. T.
87. Bee, Common Humble or Drone, the 'Bumbee' of Scotland	Bombus terrestris	Hymenoptera	Britain	W.
88. „ Humble	B. muscorum	„	Switzerland	„
89. „ Common Honey or Hive	Apis mellifica	„	Britain and N. America	W. S-W.
90. „ Carpenter	Xylocope violacea	„	France	W.
91. „ Tapestry	Anthocapa papaveris	„	„	„
92. „ Leaf-cutter	Osmia bicolor	„	Britain	„
93. „ Rose-leaf Cutter	Megachile centuncularis	„	France	„
BEETLES I. Having common English or other names.				
94. Beetle, Rose or Rose-chafer	Cetonia aurata	Coleoptera	Britain	„
95. „ Borer	Anobium striatum	„	„	„
96. „ Death Watch	A. tessellatum	„	„	„
97.	Geotrupes vernalis	„	„	„
98. „ Tumble-dung	Scarabæus carnifex	„	Ceylon	„
99.	Ateuchus pilularius	„	N. America	„
100. „ Burying or Sexton	Necrophorus vespillo	„	Britain	„
101. „ Dor or Shard-born	Geotrupes stercorarius	„	„	„
102. „ Sacred	Scarabæus sacer	„	S. Europe, W. Asia, Egypt	„
103. „ Blind	Claviger Duvalii	„	S. France	„
104. „ Common Stag	Lucanus cervus	„	Britain	„
105. „ Tiger	Cicindela campestris	„	„	„
106. „ Ladybird	Coccinella bipunctata	„	„	„

BEETLES, II.					
107.	Having no common English or other designations	Colnocera attæ	„	S. France	„
108.		Bromius vitis	„	France	„
109.		Claviger foveolatus	„	Europe	„
110.		Lomechusa strumosa	„	Britain	„
111.		Haltica oleracea	„	„	„
112.		Carabus intricatus	„	„	„
113.		Lathrus cephalotes	„	S.E. Europe	„
114.		Ateuchus cicatricosus	„	N. Africa	„
115.		Chiasognathus Grantii	„	S. Chili	„
116.		Leptorhynchus angustatus	„	New Guinea	„
117.	Beef-eater, or common Ox-pecker	Buphaga Africana	Insessores	Africa	„
118.	Bell-bird	Anthornis melanura	„	New Zealand	W. C.
119.	Bell-bird	A. melanocephala	„	Chatham Islands	W.
120.	Bell-flower Animalcule	Vorticella nebulifera	Infusoria	Britain	„
121.	Bison, or American Buffalo	Bos Bison	Ungulata	N. United States	„
122.	„ Lithuanian, or Aurochs	B. Urus.	„	Central Europe, and the Caucasus	W. S-W.
123.	Bittern, Common	Botaurus stellaris	Grallatores	Europe	W.
124.	„ Black-backed	B. pœciloptilus	„	New Zealand	W. C.
125.	Black-bird, Common	Merula vulgaris	Insessores	Europe	W. S-W. T.
126.	„ Jamaica, Savanna, Keel Bird, 'Ani,' or Hornbill Cuckoo	Crotophaga ani.	Scansores	West Indies	W.
127.	Black-cap, Black-cap Warbler, or 'Fauvette,' the 'Monk' of the Germans.	Sylvia atricapilla	Insessores	Britain and Germany	T.
128.	Black-cock, Black-grouse, or Heath-fowl	Tetrao tetrix	Rasores	Scotland and Germany	W. T.
129.	Blenny	Blennius pholis	Acanthopteri	England	C.
130.	Boa	Boa constrictor	Ophidia	Brazil	W. T.
131.	Boa	„ imperator	Ophidia	Brazil	W. T.

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132. Boar, common domestic and wild, including the Pig, Hog, or Sow	Sus scrofa	Ungulata	Britain, Ireland, Minorca, New Zealand, Central Europe, Algeria, India	W. D. T.
133. 134. Booby	Pelecanus bassanus Sula fusca	Natatores	St. Paul's Rocks	W.
Bot or Bot-flies, Breeze-flies and Gad-flies.				
135. 1. Horse Bot, Bee, or Gad-fly	Œstrus Æqui	Diptera	Britain	,,
136. 2. Ox or Cattle Bot-fly, or Gad-fly	Œ. bovis	,,	,,	,,
137. 3. Sheep Bot, Bot-fly, or Breeze-fly	Œ. ovis	,,	,,	,,
138. 4. Gad-fly of Reindeer	Œ. Tarandi	,,	Lapland	,,
139. Bowerbankia (a zoophyte)	Bowerbankia imbricata	Polyzoa	Britain	,,
140. Bower Bird, Satin	Ptilonorhynchus holosericeus	Insessores	Australia	,,
141. ,,	Chlamydera maculata	,,	,,	,,
142. Brambling, Bramble, or Mountain Finch	Fringilla montifringilla	,,	N. Europe and Asia	,,
143. Bream, Black	Cantharus lineatus	Acanthopteri	England	C.
144. Buffalo, Cape	Bos Caffer	Ungulata	S. and Central Africa	W. D. T.
145. ,, Indian	B. bubalus	,,	India, Malay Peninsula	,,
146. Bug, Bed or House	Cimex lectularius	Hemiptera	Britain, United States	W.
147. ,, Water	Ranatra linearis	,,	Nicaragua	,,
148. ,,	Pentatoma punicea	,,	England	,,
149. Bul-bul	Pycnonotus hæmorrhous	Insessores	India, Ceylon	T.

150. Bull, Brahmin, Brahminy, or Sacred; the Sacred, Indian, or Brahmin Ox, or Zebu	Bos Indicus	Ungulata	India	D. T.
151. Bull-finch, Common and Piping	Pyrrhula vulgaris	Insessores	England, Germany	C.
152. „ Pine	P. canadensis	„	New Brunswick	W.
153. „ Trumpeter, or Discot	Carpodacus pithagineus	„	N. Africa	„
154. Bunting, Meadow	Emberiza cia	„	S. Europe	„
155. „ Reed, Riverside, or Black-headed	E. schœniculus	„	Britain	„
156. „ Snow, or Snow-flake	E. nivalis	„	N. America, Europe and Asia	„
157. Bustard, Great Indian	Eupodotis Edwardsi	Grallatores	India	„
158. „ English	Otis tarda	„	England	W. T.
159. „	O. nigriceps	„	India	„
160. Butcher Bird, Great Grey or Cinereous, the Sentinel Shrike	Lanius excubitor	Insessores	Europe	W.
161. „ American	L. septentrionalis	„	N. America	„
162. Butterfly, Small Cabbage, or Turnip	Pieris Rapæ	Lepidoptera	Britain	„
163. „ Emperor, or Purple Emperor	Aptura Iris	„	„	„
164. „ Hairstreak	Thecla isocrates	„	India	„
165. „ Black-veined White	Aporia Cratægi	„	England	„
166. Buzzard, Common	Buteo vulgaris	Raptores	Scotland, Central Europe, N. America	W. T.
167. „ American, Red-tailed Hawk, or Hen Hawk	B. borealis	„	N. America	W.
168. Camel, Bactrian	Camelus Bactrianus	Ungulata	Egypt, Arabia, Persia, Mongolia	D.
169. Canary, Common Song	Fringilla canaria	Insessores	Canary Islands, Tyrol, Britain	W.C.T.
170. Capercailzie or Capercaillie, Wood-grouse, Cock of the Woods, or Heath-cock	Tetrao urogallus	Rasores	Scotland	W.

ENUMERATION OF SPECIES—*continued.*

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171. Capybara, Water Hog, Horse, or Hare of Demerara	Hydrochœrus capybara	Rodentia	S. America	W.
172. Caracal (a Lynx)	Felis Caracal	Carnivora	Africa, Asia	W. T.
173. Carp	Cyprinus carpio	Malacopteri	Central Europe, England	T.
174. Cassowary	Casuarius galeatus	Cursores	Asiatic Islands (Molucca, New Guinea)	W. C.
175. Cat, Common Domestic, including the Wild, Angora, Persian, Indian, and Spanish	Felis Catus	Carnivora	Britain, Central Europe	W. C. T. D.
176. „ Native or Wild of the Colonists	Dasyurus viverrimus	Marsupialia	Tasmania	W.
177. „ Ring-tailed of the Settlers; Mountain, of the Goldminer; or Mexican Cacomixle	Bassoris astuta	Carnivora	Mexico, Texas, California	W. C. T.
178. Cat-bird	Mimus Carolinensis	Insessores	New Brunswick	W.
179. Cavy, Patagonian, 'Mara,' or Pampas Hare	Dolichotis patachonica	Rodentia	S. America	„
180. „ Musk, Utia or Hutia	Capromys pilorides	„	Cuba	„
181. Cedar Bird, or American Waxwing	Bombycilla Carolinensis	Insessores	N. America	„
182. Centipede, Common British	Lithobius forficatus	Myriapoda	Britain	„
183. „ Common American	Scolopendra morsitans	„	Tropical America	„
184. Chaffinch, the 'Shilfa' of Scotland	Fringilla cœlebs	Insessores	Britain, Germany	C. T.

185. Chameleon	Chameleo Africanus	Lacertilia	N. Africa, France	W. C.
186. Chamois	Antilope rupicapra	Ungulata	Swiss Alps, Pyrenees, Carpathians	W.
187. Cheetah, Chittah, or Hunting Leopard	Felis jubata	Carnivora	India	D.
188. Chimpanzee, Black	Troglodytes niger	Catarrhina	W. Tropical Africa, England, France, Germany	W. C. T.
189. „ Bald, the Nest-building Ape of travellers, the 'Nshiego-Mbouvé' of the Natives	T. calvus	„	W. Tropical Africa	W.
190. „ the 'Ranya' or 'Manjarooma' of the Niam-Niams	T. Schweinfurthii	„	Central Tropical Africa	„
191. Chinchilla	Chinchilla laniger	Rodentia	Chili and Peru	„
192. Chuck-Wills-Widow (a Goatsucker)	Caprimulgus Carolinensis	Insessores	United States	„
193. Cicada	Cicada plebeia	Hemiptera	France	W. C.
194. Citril	Fringilla citrinella	Insessores	S. Europe	W.
195. Civet, Common or African, the true Civet Cat	Viverra civetta	Carnivora	N. Africa	„
196. Coati or Coatimondi	V. socialis	„	S. America	W. T.
197. Cochineal Insect	Coccus Cacti	Hemiptera	Mexico	W.
198. Cock, Rock, Cock of the Rock, or Rock Manakin	Rupicola elegans	Insessores	S. America (Guiana)	„
199. Cockatoo, White	Cacatua galerita	Scansores	Australia	W. C. T.
200. „	C. Leadbetteri			
201. Cockroach, Common, or Black Beetle	Blatta orientalis	Orthoptera	Britain	W. T.
202. Cod	Morrhua vulgaris	Anacanthini	„	W. C. T.
203. Condor	Sarcoramphus gryphus	Raptores	Central America (the Andes)	W.
204. Coney or Cony, the Syrian Daman, or Septian	Hyrax Syriacus	Hyracoidea	Syria, Palestine	W. T.

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205. Conger, or Conger Eel	Conger vulgaris	Malacopteri	England	W. C.
206. Cormorant, Common	Phalacrocorax carbo	Natatores	Britain	W.
207. „ Fishing	P. Sinensis	„	China	C. T. D.
208. „ Green or Crested Shag, the 'Scart' of Scotland	P. cristatus	„	Britain	W.
209. Corsac, Adive, or Steppe Fox	Canis Corsac	Carnivora	Central Asia	W. T.
210. Cow Bird	Molobrus pecoris	Insessores	N. America	W.
211. Crab, Common Shore, Harbour, or Small Edible	Carcinus mænas	Malacostraca	Britain	W. C.
212. „ Hermit or Soldier	Pagurus Bernhardus	„	„	„
213. „ Hermit	P. Prideauxii	„	England	W.
214. „ Robber or Purse	Birgus latro	„	Pacific and Malayan Islands, Mauritius	„
215. „ Black or Mountain	Gecarcinus ruricola	„	Jamaica	„
216. „ Pea	Pinnotheres pisum	„	Britain	W. C.
217. „	P. veterum	„	Mediterranean	„
218. Crake, Common, Corncraik, or Landrail	Crex pratensis	Grallatores	Britain	W.
219. Crane, Common	Grus cinerea	„	N. Europe and Asia	„
220. Cricket, Field	Acheta campestris	Orthoptera	England	W. C.
221. „ House	A. domestica	„	Britain	„
222. Crocodile, Common or Nile	Crocodilus vulgaris	Crocodilia	Africa	W.
223. „	C. acutus	„	S. America (Guayaquil)	„
224. Crossbill, Common	Loxia curvirostra	Insessores	British Islands	„

225.	„ American White-winged	L. leucoptera	„	New Brunswick	„
226.	„	L. socia	„	S. Africa	„
227.	Crow, Common, the 'Hoody' of Scotland	Corvus corone	„	Scotland	„
228.	„ Royston	C. cornix	„	„	„
229.	„ American Carrion	C. Americanus	„	New Brunswick	„
230.	„ Fish	C. ossifragus	„	„	„
231.	„ Indian	C. splendens	„	India	„
232.	„ Cornish or red-legged, the Common Chough	Fregilus graculus	„	Britain	„
233.	„ Orange	Glaucopis cinerea	„	New Zealand	W. C.
234.	„ Blue-wattled	G. Wilsoni	„	„	W. C. T.
235.	„ Piping, Piping Grakle, or 'Jar-ra-war-rang' of the Natives	Barita tibicen	„	New South Wales	W.
236.	Cuckoo, Common	Cuculus canorus	Scansores	Britain, Greece, India	„
237.	„ Shining	Chrysococcyx lucidus	„	New Zealand	„
238.	„ Long-tailed	Eudynamis Taitensis	„	„	„
239.	Curassow, Black	Penelope nigra	Rasores	S. America (Guatemala)	„
240.	„ Hocco	Crax alector	„	„ (Guiana)	T.
241.	Curlew, Stone	Œdicmenus crepitans	Grallatores	England	W.
242.	Cuttle-fish, Common, the 'Ink-Spewer' of Sailors	Sepia officinalis	Cephalopoda	„	W. T. C.
243.	Daw, or Jackdaw	Corvus monedula	Insessores	Britain	W. T.
244.	Deer, Roe	Cervus capreolus	Ungulata	Scotland	W. or S-W.
245.	„ Red	C. elaphus	„	Britain	W. S-W. T.
246.	„ Spotted of Indian sportsmen, or Axis,	C. axis	„	India, Australia, Britain, France	W. C. T.
247.	„ Hog	C. porcinus	„	India and Ceylon	W. C.
248.	„ Fallow	C. Dama	„	Britain	W. S-W.
249.	„ Virginian	C. Virginianus	„	United States	W.
250.	„ Black-tailed, or the Black Tail	C. macrotis	„	N. America	„

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251. Devil, Tasmanian	Dasyurus ursinus	Marsupialia	Tasmania	W.
252. Devil Fish (a Ray)	Cephaloptera Massena	Plagiostomi	Mediterranean	„
253. Diver, Red-throated, or 'Wobby'	Colymbus septentrionalis	Natatores	N. America (Island of Anticosti)	„
254. Dog, Common Domestic, including the following sub-species, varieties, breeds, or races	Canis familiaris	Carnivora		S-W. D. T.
„ Native, or 'Dhole' of India			India	W.
„ Shepherd's, Sheep, or Cattle, the 'Collie' of Scotland			Scotland, Australia, California, Syria, Spain	D.
„ Eskimo or Siberian			Greenland, Labrador, Lapland, Arctic Asia	„
„ Pariah or Outcast			Turkey, Syria, Egypt, India, Ceylon	W. or S-W.
„ Hounds: Wolf, Grey and Fox			Britain	D.
„ Hound, Blood			Cuba	„
„ Poodles, French and Performing			Britain, France	D. T.
„ Lap-dogs, Japanese Pugs or other			Britain	„
„ Spaniels, Common and Water			„	D.

	„ Terriers, Scotch or Skye, English Bull, Fox, and other	. . . . .	. . . .	„	„
	„ St. Bernards	. . . . .	. . . .	Switzerland . . .	„
	„ Miscellaneous: Newfoundland, Watch-dog, Mastiff, Coach or Dalmatian, Pomeranian, Retriever, Pointer, Setter, Harrier, Lurcher, Turnspit	. . . . .	. . . .	Britain	„
255.	„ Australian Wild, or Dingo	C. Dingo	„ . .	Australia	W. T.
256.	„ Wild of South Africa, Cape Hunting Dog, Hyæna Dog, or Dog Hyæna; the 'Waraba' or 'Darwa' of the Natives	C. venaticus	„ . .	S. Africa	W. C. D.
257.	„ Bull.	C. anglicus	„ . .	England, United States .	D.
258.	„ Deer or Stag Hound .	C. sagax	„ . .	Britain	„
259.	Dog-Fish, Common (a shark)	Acanthias vulgaris . . .	Plagiostomi .	N. Atlantic. . . .	C.
260.	„ Smooth . .	Mustelus lævis	„ . .	Pegu and Siam . . .	T.
261.	Dolphin, Common . .	Delphinus delphis . . .	Cetacea . .	N. Atlantic and Mediterranean . . .	W.
262.	Dormouse, Common or Red, the Muscardine .	Muscardinus avellanarius. .	Rodentia . .	Britain	„
263.	Dotterel (a plover) . .	Charadrius morinellus . .	Grallatores .	„	„
264.	Dove, Common Turtle. .	Turtur communis . . .	Rasores . .	England	W. C. T.
265.	„ Eastern „ . .	T. risorius	„ . .	Syria, Palestine, Greece, Turkey, N. Africa .	„
266.	Dragon-Fly, Common . .	Libellula depressa . . .	Neuroptera .	Britain	W.
267.	Dromedary, African, or Arabian Camel .	Camelus Dromedarius . .	Ungulata . .	Arabia, Syria, Palestine, N. Africa, England.	C. T. D.
268.	Duck, Common Domestic, including the Wild Duck or Mallard. . .	Anas boschas	Natatores . .	Britain	W. D. T.

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269. Duck, Eider	Anas mollissima	Natatores	Iceland and Norway	T.
270. „ Mandarin	A. galericulata	„	China	W.
271. „ Canvas-back	A. vallisneria	„	N. America	„
272. „ Red-head	A. ferina	„	„	„
273. „ American Widgeon	A. Americana	„	„	„
274. „ Long-tailed or Harcld	Harelda glacialis	„	Arctic Regions, Orkney and Shetland	„
275. „ Musk or Muscovy	Cairina moschata	„	Guiana, Britain	W. C. T.
276. „ Common or Black Scoter	Oidemia nigra	„	Britain, France	W.
277. „ Velvet Scoter	O. fusca	„	Orkney	„
278. „ Mountain, of the Colonists	Hymenolæmas malacorrhynchus	„	New Zealand	„
279. Duck-bill, or Water-mole of the Australian Colonist	Ornithorhynchus paradoxus	Monotremata	New South Wales	T.
280. Dugong, Indian	Halicore Indica.	Sirenia	Indian Archipelago, Ceylon	W.
281. Eagle, Golden	Aquila chrysietos	Raptores	Scotland	„
282. „ 'Wokhab'	A. fulvescens	„	India	„
283. „ White-tailed, the Common Erne	Haliäetus albicilla	„	Scotland	„
284. „ White-headed or Bald	H. leucocephalus	„	N. America	„
285. „ Laughing	Herpetotheres cachinnans	„	S. America.	„
286. „	H. Ponticerianus	„	India	„
287. Earwig, Common	Forficula auricularia	Orthoptera	Britain	„
288. Eel, Marsh Dog	Mursena syren	Malacopteri	Georgia (U.S.A.)	„
289. Eland or Elam	Antilope oreas	Ungulata	S. Africa	„

290.	Electric Eel	Gymnotus electricus.	Malacopteri	S. America.	W. T.
291.	„ Fish, 'Raash' or Thunder Fish of the Arabs	Malopterurus electricus	„	N. Africa	W.
292.	Eledone	Eledone cirrhosa	Cephalopoda	England	C.
293.	Elephant, African.	Elephas Africanus	Proboscidea	Africa	W. D.
294.	„ Asiatic.	E. Indicus.	„	India, Ceylon, Siam, Burmah, Pegu, Tenasserim	W. C. T. D.
295.	Elk	Cervus strongyloceros	Ungulata	N. America	W.
296.	Emu or Emeu	Dromaius Novæ Hollandiæ	Cursores	Australia	„
297.	Ermine or Stoat, the 'Whittret' of Scotland	Mustela erminea	Carnivora	N. Europe and America	„
298.	Falcon, Peregrine, the 'Blue Hawk' of Scotland	Falco peregrinus	Raptores	Britain	T.
299.	„ Iceland, Jer- or Gyr-Falcon	F. Islandicus	„	Britain, Germany, India, Iceland, Greenland, Norway	W. T.
300.	„ Lanner	F. laniarius	„	Europe	T.
301.	„	F. Washingtonii	„	United States (New Jersey)	W.
302.	Fantail, Pied	Rhipidura flabellifera	Insessores	New Zealand	W. C.
303.	Fennec or Zerda	Vulpes Zerda	Carnivora	N. Africa	W. T.
304.	Ferret	Mustela furo	„	Britain	S-W. T.
305.	Fighting Fish	Macropodus pugnax	Acanthopteri	Siam	T.
306.	Flamingo, American	Phœnicopterus Americanus	Natatores	S. America.	W.
307.	Flea, Common	Pulex irritans	Aphaniptera	Britain, Australia	T.
308.	Fly, Common Domestic or House	Musca domestica	Diptera	Britain	W. or S-W.
309.	„ Flesh, Meat, or Blow, the Blue Bottle	M. carnaria	„	„	W.
310.	„ Forest, or Horse	Hippobosca equinia	„	England	„
311.	„ Golden-eye	Chrysopa perla	Neuroptera	Britain	„
312.	„	C. vulgaris	„	Europe	„
313.	Fly-catcher, Pied.	Muscicapa atricapilla	Insessores	Britain	„
314.	„ Spotted	M. griseola	„	„	W. C.

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315. Fowl, Common, Domestic or Barn-door, including the Bantam, Fighting, or Game Cock	Gallus domesticus	Rasores	Britain, N. America	D. T.
316. „	„ Stanleyi	„	Ceylon	W.
317. Fox, Common or Siberian	Vulpes vulgaris	Carnivora	England, N. America, Swiss Alps, Syria, Palestine	W. C. T.
318. Fox, Magellan	Vulpes Magellanicus	Carnivora	S. America	W.
319. „ Arctic, or Hare Indian Dog	V. lagopus	„	Arctic Europe, Asia and America	„
320. „ Azara	Canis Azaræ	„	S. America	W. C.
321. Frog, Common or Red	Rana temporaria	Amphibia	Britain, France	W.
322. „ Green or edible	R. esculenta	„	France and S. Europe	„
323. „ Tree	Hyla arborea	„	Central and S. Europe	W. C.
324. Frost-fish, the 'Hiku' of the Maoris	Lepidopus caudatus	Acanthopteri	New Zealand	W.
325. Gad-fly	Tabanus bovinus	Diptera	Britain	„
326. Gallicrex (Bird)	Gallicrex cristatus	Grallatores	E. Bengal	„
327. Gallinule, Common, the Water Hen or Moor Hen	Gallinula chloropus	„	„	T.
328. Gannet, Australian	Sula serrator	Natatores	New Zealand	W.
329. Gayal	Bos gavæus	Ungulata	India	W. D. T.
330. Gazelle	Antilope Dorcas	„	N. Africa, Syria, Arabia, Persia	W.
331. Genet or Genette, Common	Viverra genetta	Carnivora	S. Europe, N. Africa	W. T.
332. Gibbon, Common or Lar	Hylobates lar	Catarrhina	Malacca	T.
333. „ Agile or Active	H. agilis	„	Sumatra	W. T.

334. „ Hoolook	H. Hoolook	„	India (Brahmapootra)	T.
335. „ Wow-wow	H. leuciscus	„	Malacca	„
336. „ Siamang	H. syndactylus	„	Sumatra, Java, and Malayan Peninsula	W. T. C.
337. Giraffe, or Camelopard	Camelopardalis Giraffa	Ungulata	N. and S. Africa, France, England	W. C.
338. Glutton, Wolverine or Wolverene	Gulo luscus	Carnivora	N. Europe, Asia and America	W.
339. Gnat, Common	Culex pipiens	Diptera	England, Iceland, Lapland	„
340. Gnu or Gnoo, Brindled, or Kokoon	Antilope Gnu	Ungulata	S. Africa	„
341. Goat, Common or Domestic	Capra Hircus	„	Britain	S-W. D. T.
342. „ Passeng or Ægragrus	C. Ægagrus.	„	Syria, Palestine, Asiatic mountains (the Caucasus)	W. S-W. T.
343. „ Wild, Ibex, Steinbok or Bouquetin	C. Ibex	„	Swiss Alps	W. T.
344. „ Angora	C. angorensis	„	Asia Minor, Europe	W. D.
345. „	C. mambrica	„	Syria	W.
346. Goatsucker, Common or European, the Night-jar or Churr, Churn or Fern-owl	Caprimulgus Europæus	Insessores	Britain	„
347. „ American	C. Carolinensis	„	N. America	„
348. Goldfinch	Carduelis communis	„	Britain	C. T.
349. Goldfish, or Golden Carp	Cyprinus auratus	Malacopteri	China, Britain	„
350. Goose, Common or Domestic, including the Grey or Lag	Anser ferus	Natatores	Britain	W. S-W. D.
351. „ Canada	A. Canadensis	„	N. America (Island of Anticosti)	W. T.
352. „ Chinese	A. Sinensis	„	China	D.
353. „ Barnacle or Bernicle	A. leucopis	„	Britain, Norway	W.
354. „	Cereopsis Novæ Hollandiæ	„	Australia	„

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355. Gorilla of the Portuguese, 'Ngina' or 'Ingeena' of the Natives	Troglodytes Gorilla	Catarrhina	W. Equatorial Africa, Germany	W. C.
356. Grakle, Indian, or Mina Bird	Gracula Indica	Insessores	India	W. T.
357. Grampus, Killer or Sword-fish of English sailors	Orca gladiator	Cetacea	Greenland	W.
358. Grasshopper, Great Green	Gryllus viridissimus	Orthoptera	England	C. T.
359. Grass-quist	Spermophila olivacea	Insessores	Jamaica	W.
360. Grebe, Little, Dab or Dab-chick	Podiceps minor	Natatores	Scotland	„
361. „ Great Crested	P. cristatus	„	Britain, New Zealand	„
362. Goshawk	Astur palumbarius	Raptores	Scotland	T.
363. Greenfinch, Green-linnet, the 'Green Lintie' of Scotland	Fringilla chloris	Insessores	Britain	W. C.
364. Grison	Galictes vittata	Carnivora	S. America	W.
365. Groundlark of the Colonists, or New Zealand Pipit	Anthus Novæ Zelandiæ	Insessores	New Zealand	„
366. Grouse, Common or Red, Moorfowl, Red or Brown Ptarmigan	Lagopus Scoticus	Rasores	Scotland	„
367. „ Pinnated, Prairie Hen, or Cupid Pheasant	Tetrao Cupido	„	United States	„
368. „ Canada or Spotted, the Spruce Partridge	T. Canadensis	„	New Brunswick	„
369. „ Ruffed, the Ruffed or Birch Partridge	T. umbellus	„	„ and Canada	„

370. „ the Common Partridge of the Settlers	T. phasaniellus	„	N. America	„	
371. Guan or 'Yacon'	Penelope cristata	Rasores	S. America (Brazil and Guiana), Britain	W. T.	
372. Guanaco, Huanaco or Huanaca	Auchenia Huanaco	Ungulata	S. America (Brazil, Patagonia), France	W. C. T.	
373. Guillemot, Common or Foolish	Uria troile	Natatores	Arctic regions, Britain	W.	
374. Guinea Fowl, Wild, or 'Pintado' of the Colonists	Numida cornuta	Rasores	S. Africa	„	
375. Guinea Pig, Common, or Restless Cavy	Cavia cobaya	Rodentia	S. America, Britain	T. D.	
376. Gull, Herring	Larus argentatus	Natatores	N. America, Britain	W.	
377. „ Mackerel	L. scopulinus	„	New Zealand	„	
378. „ Black-billed	L. Bulleri	„	„	W. T.	
379. „ Southern Black-backed	L. dominicanus	„	„	W. C. T.	
380. „ Great Northern black-backed, or 'Wagel'	L. marinus	„	N. Scotland	W.	
381. „ Lesser Black-backed	L. fuscus	„	Britain	„	
382. „ Common, Sea-maw or -mew	L. canus	„	„	W. T. C.	
383. „ Skua, or Common Skua	L. parasiticus	„	Arctic seas, Shetland	W.	
384. Hamster, or Hampster, Common	Cricetus vulgaris	Rodentia	Central Europe	„	
385. Hapalote, Mitchell's, or 'Barroo' of the Natives	Hapalotis albipes	„	Australia	„	
386. Hare, Common	Lepus timidus	„	Britain, France	W. T.	
387. „ Greenland	L. glacialis	„	E. Greenland	W.	
388. „ Calling	Lagomys pusillus	„	Russia	„	
389. „ Alpine or Arctic, Pika, the Pica, or 'Ladajac'	L. alpinus	„	Siberia	„	
390. „ 'Ogotono' of the Mongols	L. Ogotono	„	Mongolia	„	

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391. Harrier (Bird)	Circus Gouldi	Raptores	New Zealand	W. C.
392. Hawfinch	Coccothraustes vulgaris	Insessores	Britain	W.
393. Hawk, Common Sparrow	Accipiter Nisus	Raptores	„	W. T.
394. „ Bush	Hieracidea brunnea	„	New Zealand	W.
395. Hedgehog, Common	Erinaceus Europæus	Insectivora	Britain	W. T.
396. Hemipode, black-breasted	Turnix taijoor	Rasores	India and Ceylon	W.
397. Heron, Common Grey or Crested	Ardea cinerea	Grallatores	Britain	„
398. „	A. Herodias	„	N. America	„
399. „ Night	Nycticorax Gardeni	„	America	„
400. „	N. griseus	„	British Islands	„
401. Herring, Common	Clupea harenga.	Malacopteri	Scotland	C. T.
402. Herrings, King of the	Chimæra monstrosa	Elasmobranchii	Britain	W.
403. Hippopotamus, Common	Hippopotamus amphibius	Ungulata	Africa, England, France	W. C.
404. Honey Guide	Indicator Sparmanni	Insessores	S. Africa	W.
405. Hoopoe, Common	Upupa epos	„	Africa, Britain	„
406. Hornbill, American	Tanajer Mexicana	„	N. America	T.
407. Hornet	Vespa crabro	Hymenoptera	England	W.
408. Horse, Common or Domestic, including the—	Equus Caballus	Ungulata	Britain	D.
Wild Horse		„	N. American Prairies, S. American Pampas, Ukraine	W.
„ Mustang		„	Mexico	W.S-W.D.
„ Arab		„	Arabia, Syria	D. T.
„ Mongol		„	Central Asia, (Mongolia, Tartary)	W.S-W.D.

„ Military or Cavalry Charger	. . . . .	„	Britain, Germany, France	D.
„ Hunter, Carriage and Riding, Dray, Cart, and Plough	. . . . .	„	Britain, Australia . .	„
„ Race . . .	. . . . .	„	Britain	„
„ Cleveland Bay .	. . . . .	„	England	„
„ Pony . . .	. . . . .	„	Iceland, Shetland . .	S-W. D.
409. Huia (Bird) . . .	Heterolocha acutirostris . .	Scansores .	New Zealand . . .	W. C.
410. „	H. Gouldi	„ .	„ . . .	W. C. T.
411. Humming Bird, Ruby-Throated, or Bird-fly	Trochilus colubris . . .	Insessores .	New Brunswick, Florida	W.
412. „	Selasphorus platycercus . .	„ .	N. America, Guatemala and Mexico . .	„
413. Hyæna, Common or Striped .	Hyæna striata	Carnivora .	N. Africa, Asia (Arabia, Syria, Persia) . .	W. T.
414. „ Spotted, or Laughing, the 'Tiger-wolf' of the Colonists . .	H. crocuta	„ .	S. Africa	„
415. Hydatids, Brain . . .	Acephalocystis globulosa . .	Scolecida .	France	W.
416. Ichneumon, Common or Egyptian . . .	Herpestes Ichneumon . .	Carnivora .	Egypt	T.
417. Indri, Short-tailed . .	Indris brevicaudatus . . .	Strepsirrhina .	Madagascar . . .	„
418. Jacana, Common . . .	Parra jacana	Grallatores .	Brazil, Guiana . . .	W.
419. Jackal, Common . . .	Canis aureus	Carnivora .	India, Ceylon, Syria, S. Africa	„
420. Jackass, Laughing, Laughing Kingfisher, or Great Brown or gigantic Kingfisher, the 'Gogobera' of the Natives . .	Dacelo gigantea . . .	Scansores .	New South Wales . .	„
421. Jaguar, American, or Tiger Ounce . . .	Felis onça	Carnivora .	S. America . . .	W. T.
422. Jay, Common . . .	Garrulus glandarius . . .	Insessores .	Britain	C. T.
423. „ Blue	G. cristatus	„ .	New Brunswick . .	W.
424. Jerboa, Egyptian . . .	Dipus Ægypticus . . .	Rodentia .	N. Africa, Arabia . .	„

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425. Jerboa, Siberian, or 'Alactaga'	D. Alactaga	Rodentia	N. Asia (Tartary and the Altai)	W.
426. Jungle Fowl, or Megapode	Megapodius tumulus.	Rasores	Australia	„
427. 'Kaka' Parrot of the Natives	Nestor meridionalis	Scansores	New Zealand	W. C. T.
428. Kangaroo, Great	Macropus giganteus	Marsupialia	Australia, Britain	„
429. 'Kea' Parrot of the Natives the 'Mountain Parrot' of the Colonists	Nestor notabilis	Scansores	New Zealand	W. C.
430. Kingcrow, Common	Dicrurus macrocerus	Insessores	India	W.
431. Kingfisher, Sacred	Halcyon sanctus	Scansores	Australia	„
432. „ New Zealand	H. vagans	„	New Zealand	W. C.
433. „ Belted	Ceryle Halcyon	„	N. America	W.
434. Kite, Govinda or Brahmanny	Milvus Govinda	Raptores	India	„
435. Kiwi	Apteryx Mantelli	Cursores	New Zealand	W. C.
436. Koala, Native Sloth or Bear	Phascalarctos cinereus	Marsupialia	Australia	W. C. T.
437. Lama or Llama	Auchenia lama	Ungulata	S. America, Australia	W. D.
438. Lämmergeier, Bearded Vulture, Griffin, or Gier Eagle	Gyphäetus barbatus	Raptores	Syria, Palestine, Pyrenees	W.
439. Lapwing, Common or Crested, the 'Peewit' or 'Peesweep' of Scotland	Vanellus cristatus	Grallatores	Britain	„
440. Lark, Common Sky or Field	Alauda arvensis	Insessores	„	W. C.
441. „ Shore	A. alpestris	„	N. America (Labrador)	W.
442. „ Crested	A. cristata.	„	France	T.

443. „ Calandra	Melanocorypha calandra	„	Europe and N. Africa	W.
444. Leech, Medicinal	Sanguisuga medicinalis	Annulosa (Hirudinea)	S. Europe, Britain	W. C.
445. „ Horse	Hæmopis sanguisorba	„	Britain	„
446. Lemming, or Norway Rat	Myodes lemmus	Rodentia	Lapland, Mountains of Sweden and Norway	W.
447. „ American or Greenland	M. torquatus	„	N. Europe, Asia, and America	„
448. Lemur, the Madagascar Cat of Sailors	Lemur macaco	Strepsirrhina	Madagascar	W. T.
449. „ Ring-tailed	L. catta	„	„	C.
450. „ Whitefaced	L. albifrons	„	„	„
451. Leopard, or Panther	Felis pardus	Carnivora	Africa, S. Asia, (Ceylon)	W. C.
452. Linnet, Common or Brown, the 'Lintie' of Scotland	Linaria linota	Insessores	N. Britain, Greenland	„
453. Lion	Felis leo	Carnivora	N. Africa (Algeria), S. Africa, S. Asia (India), Mesopotamia, England	W. C. T.
454. Lizard, Common or Viviparous	Zooteca vivipara	Lacertilia	England	C.
455. „ Frill	Chlamydosaurus Kingii	„	Australia	W.
456. „ Monitor or Varan	Monitor Niloticus	„	N. Africa	T.
457. „	Lyriocephalus scutatus	„	Ceylon	W.
458. „	Anobis cristatellus	„	S. America	„
459. Lobster, Common	Homarus vulgaris	Crustacea	Britain, Norway	W. C.
460. Loon, or Northern Diver	Colymbus glacialis	Natatores	New Brunswick, and Island of Anticosti	W.
461. Lori, slowpaced	Loris tardigradus	Strepsirrhina	Malayan Peninsula, Borneo, and Sumatra	W. C.
462. „	L. gracilis	„	India, Ceylon	„
463. Lice, Plant or Root	Aphis radicum	Hemiptera	Britain	W.
464. Lynx, European	Lynx virgatus	Carnivora	N. Europe and Asia	„
465. „ N. American	L. Canadensis	„	New Brunswick	„
466. „ Bay	L. rufus	„	Mexico	„

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467. Lyre-Bird, Lyre-tail, or Lyre-pheasant	Menura superba	Insessores	New South Wales	W.
468. „	M. Alberti.	„	Australia	„
469. Macaco, Woolly	Lemur Mongoz	Strepsirrhina	Madagascar	„
470. Mackerel, Common	Scomber vernalis	Acanthopteri	Britain, N. America	„
471. Magpie, Common, or Pie	Pica caudata	Insessores	Scotland	W. T.
472. „ of the Colonists	Cracticus picatus	„	Australia	W.
473. „	Lanius collaris	„	N. America	„
474. Manakin	Pipra deliciosa	„	S. America.	„
475. Manatee, or Lamantin, Sea Cow or Woman-Fish	Manatus australis	Sirenia	W. Indies and S. America	„
476. Mandrill, or Rib-nose Baboon	Cynocephalus Maimon	Catarrhina	W. Tropical Africa (Guinea Germany	C. T.
477. Mangouste, Mongus, Mongoose, or Grey Ichneumon	Herpestes griseus	Carnivora	India, Ceylon, S. Africa	T.
478. Marmot, European or Common	Arctomys Marmota	Rodentia	Europe	W.
479. „ Alpine	A. alpinus	„	Swiss Alps and Pyrenees	„
480. „ Quebec or N. American, the 'Weemusk' or Thickwood Badger	A. monax	„	N. America	„
481. „ Tibetan, the 'Tarabagan' of the Mongols	A. robustus	„	Tibet	„
482. „ Asiatic, or 'Bobac'	A. Bobac	„	Poland and Russia	„
483. Marten, Common Beech or Stone	Martes foina	Carnivora	Scotland	W. T.
484. „ Pine	M. abietum	„	Britain	W.
485. Martin, House, or Common Window Swallow	Hirundo urbica.	Insessores	Scotland, France	W. or S-W.

486. „ Purple	H. purpurea	„	New Brunswick	W.
487. „ Sand	H. riparia	„	Scotland	„
488. „ Fairy	H. ariel	„	Australia	„
489. Meat or Moose Bird	Garrulus Canadensis	„	New Brunswick	„
490. Medusa, Fish-Sheltering	Aurelia aurita	Hydrozoa	Britain	W. C.
491. Meminna or Pisora, (a Musk Deer)	Meminna Indica	Ungulata	India and Ceylon	W.
492. Merlin, Merlin Hawk, or Stone Falcon	Falco æsalon	Raptores	Scotland	W. T.
493. Merganser, Red-breasted, or Dun-diver	Mergus serrator	Natatores	„	W.
494. Merlo (Bird)	Merula minor	Insessores	Brazil.	W. C. T.
495. Mocking Bird, or Thrush	Mimus polyglottus	„	United States	„
496. Mole, Common	Talpa Europæa	Insectivora	Britain	„
MONKEYS: I. Having Popular designations.				
497. Monkey, Malbrook	Cercopithecus cynosurus	Catarrhina	W. Africa	„
498. „ Grivet	C. sabæus	„	„	„
499. „ Mona, or Varied	C. Mona	„	N. and W. Africa, France	W. T.
500. „ Patas	C. ruber	„	W. Africa	W.
501. „ Roloway or Diana	C. Diana	„	W. Africa (Guinea)	„
502. „ Sooty Mangabey	C. fuliginosus	„	W. Africa (Gambia)	„
503. „ Douc or Duk	Semnopithecus nemæus	„	Cochin-China	„
504. „ 'Hanuman' or Sacred	S. entellus	„	India and Ceylon	W. or S-W.
505. „ Wanderoo	S. leucoprymnus	„	Ceylon	W. C.
506. „ Lungoor	S. mitratus	„	India, Siam, Java, Sumatra	W.
507. „ Guereza	Colobus Guereza	„	Central Africa, Abyssinia	„
508. „ Black	Cynopithecus niger	„	Celebes and Moluccas, Germany	W. C.
509. „ Talapoin	Miopithecus Talapoin	„	W. Africa	„
510. „ Rhesus or Bhunder	Macacus Rhesus	„	India, Germany	W. C. T.
511. „ Tocque or Radiated Macaque	M. radiatus	„	„ „	W. C.

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512. Monkey, Coaita or Quata .	Ateles paniscus. . . .	Platyrrhina .	S. America (Amazons) .	W. T.
513. „ Marimonda . .	A. Beelzebub	„ . .	S. America (Orinoco and Guiana) . . .	„
514. „ Chamack, Chamuk or Chameck . .	A. pentedactylus . . .	„ . .	S. America. . . .	„
515. „ Spider, or Sapajou .	A. arachnoides . . .	„ . .	S. America (Brazil and Paraguay) . .	„
516. „ Marmoset or Ouistiti	Hapale penicillata . .	„ . .	S. America (Brazil and the Amazons) . .	„
517. „ Striated, Jaco, or Sanglain . .	H. Jacchus	„ . .	S. America (Brazil and Guiana), England .	W. C. T.
518. „ Negro . . .	Lagothrix Humboldti . .	„ . .	S. America (Bolivia, Peru, Venezuela) . .	W.
519. „ Masked Callithrix.	Callithrix personatus . .	„ .	S. America. . . .	„
520. „ Collared Callithrix	C. torquatus	„ . .	Brazil	„
521. „ Siamiri, Titi, or Tec-tee . . .	C. sciureus	„ . .	Brazil, Guiana, and Orinoco . . .	W. T.
522. „ Preacher . .	Pithecia Satanas . . .	„ . .	S. America . . .	W.
523. „ Couxio . . .	P. sugulata	„ . .	Do. (Brazil and Guiana) .	„
524. „ Cacajao . .	P. melanocephala . . .	„ . .	S. America (New Grenada and Guiana) . .	„
525. „ Mirikina . .	Nyctipithecus trivirgatus .	„ . .	S. America. . .	„
526. „ Araguato, Ursine Howler, Howling, Howler or Stentor . .	Mycetes ursinus . . .	„ . .	„	W. C. T.
527. „ Ouarapavi, or White-faced . .	M. albifrons	„ . .	Central and S. America .	W.

528. „ Horned Sapajou	Cebus fatuellus	„	S. America (Brazil and Venezuela)	„
529. „ Capuchin or Capucin	C. capucinus	„	S. America (Orinoco)	„
530. „ Tamarin	Midas rosalia	„	Do., Europe	W. T.
MONKEYS II.				
531.	Macacus cynomolgus	Catarrhina	Malayan Peninsula and Archipelago, and Germany	T. D. C.
532. Without popular designations	M. silenus	„	India	W. C. T.
533.	M. Assamensis	„	Burmah	T.
534.	M. nemestrinus	„	Germany	C.
535.	Cebus Azaræ	Platyrrhina	S. America (Paraguay)	W.
536.	Mycetes cavaya	„	S. America	„
537.	Midas argentatus	„	Do. (the Amazons)	W. C.
538. Moose, or Moose Deer	Cervus alces	Ungulata	N. Europe, Asia, and America	W. T.
539. Moth, Emperor	Saturnia pavonia	Lepidoptera	England	W.
540. „ Brown-tail	Liparis chrysorrhœa	„	Britain	„
541. „ Death's Head, Hawk Moth or Sphinx	Acherontia atropos	„	„	„
542. „ Convolvulus Hawk	Sphinx convolvuli	„	„	„
543. „ Mullein Shark	Cucullia Verbasci	„	England	„
544. „ Processionary, or Processionary Caterpillar	Cnethocampa processionea	„	S. Europe	„
545. „	Noctua Ewingii	„	Tasmania	„
546. Mouse, Common House or Domestic	Mus musculus	Rodentia	Britain	W. T.
547. „ Wood	M. sylvaticus	„	„	„
548. „ Field (a Vole)	Arvicola hispida	„	Florida	W.
549. „	A. socialis	„	Syria	„
Mule, Common	*Vide* Horse and Ass	Ungulata	N. and S. America, Syria, Switzerland, and Spain	D.
550. Mullet, Common, Grey or Thick-lipped	Mugil chelo	Acanthopteri	Britain, Mediterranean,	W. T.

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551. Musk Deer, the true	Moschus moschiferus	Ungulata	Central Asia	W.
552. „ Ox or Sheep	Ovibos moschatus	„	Arctic America and Greenland	„
553. „ Rat, Musquash or 'Ondatra,' (a Beaver)	Fiber zibethicus	Rodentia	New Brunswick	„
554. Napu (a Musk Deer)	Tragulus Javanicus	Ungulata	Malayan Peninsula and Islands	W. T.
555. Narwhal, Sea Unicorn or Unicorn Whale	Monodon monoceros	Cetacea	Arctic Seas	W.
556. Newt, Common, Smooth, or Eft	Triton punctatus	Amphibia	Britain	W. C.
557. „ Warty, or Great Water	T. cristatus	„	„	„
558. Nightingale, Common	Philomela luscinia	Insessores	„	„
559. Noddy	Megalopterus stolidus	Natatores	St. Paul's Rocks	W.
560. Nutcracker	Nucifraga caryocatactes	Insessores	Britain, Russia, Norway, Swiss and Austrian Alps	„
561. Nuthatch	Sitta Europæa	„	Britain	W. C. T.
562. Nyl (or Nil) Ghau	Antilope picta	Ungulata	India and Persia	W. T.
563. Ocelot, Common	Felis pardalis	Carnivora	N. and S. America, and England	W. C.
564. Octodon	Octodon degus	Rodentia	Chili	W.
565. Octopus, Common, the 'Pieuvre' of the French, the 'Pulpo' or 'Polpo' of the Spaniard	Octopus vulgaris	Cephalopoda	England, Channel Islands, Spain and Portugal, Italy, Tunis, Algeria, and Morocco	W. C.

566. Opossum, Virginian	Didelphys Virginiana	Marsupialia	N. Carolina	W.
567. Orang-Otang (Utang or Utan), the 'Mias' of the natives	Simia satyrus	Catarrhina	Indian Archipelago (Borneo, and Sumatra)	W. C. T.
568. Orang	S. Abelii	„	„	W. C.
569. „ Black or 'Pongo'	S. Wurmbii	„	Borneo	W.
570. Oriole, or Auriole, Golden	Oriolus galbula	Insessores	Italy and Sweden	„
571. „ Baltimore, or Baltimore Bird (a starling)	Icterus Baltimorii	„	N. America	„
572. „ Orchard	I. spurius	„	„	„
573. „	I. pecoris	„	„	„
574. Ortolan	Emberiza hortulana	„	S. Europe and N. Africa	„
575. Ostrich	Struthio Camelus	Cursores	S. Africa, Arabia, Britain	W. C. T.
576. Otter, Common	Lutra vulgaris	Carnivora	Scotland	W. T.
577. „ Canadian or American	L. Canadensis	„	N. America	W.
578. „ Sea, or 'Kalan'	L. marina	„	Behring's Straits	„
579. Ousel or Ouzel, Water, or Dipper	Cinclus aquaticus	Insessores	Scotland	W.
580. Oven-bird	Furnarius fuliginosus	„	S. America	„
581. Owl, Common White, Screech, Golden or Barn	Strix flammea	Raptores	Scotland	W. T.
582. „ Short-eared	S. brachyotus	„	Britain	W.
583. „ Brown, Tawny or Ivy	S. ulula	„	Scotland	W. T.
584. „	S. otus	„	N. America	W.
585. „ Great or Eagle	Bubo maximus	„	Europe	„
586. „ Little	Athene noctua	„	Britain	„
587. „ Burrowing or Coquimbo	A. cunicularia	„	S. America	„
588. „	A. socialis	„	N. America	„
589. „ Laughing	Sceloglaux albifacies	„	New Zealand	W. C.
590. Ox, Common Domestic, including the Bull, Milk Cow, Market and Working Cattle, along with	Bos taurus.	Ungulata	Britain, N. America, Australia, and New Zealand	D. T.
„ Wild Cattle	. . . . .	„	England (Chillingham) and N. and S. America	W. S-W. C.

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Ox, Fighting Bull	Bos taurus	Ungulata	Spain, Mexico	S.-W. C.
591. Oyster-catcher, or Sea Pie	Hæmatopus ostrealegus	Grallatores	Britain	W.
592. „ Pied	H. longirostris	„	New Zealand	„
593. Paradise, Bird of, Common Great or Emerald	Paradisea Papuana	Insessores	Papua (or New Guinea)	W. C.
594. „	P. apoda	„	England	C.
595. Parroquet, or Parrakeet, Alexandrine	Palæornis Alexandri	Scansores	India, Ceylon	W. T.
596. „ Red-fronted	Platycercus Novæ Zelandiæ	„	New Zealand	W. C.
597. „ Yellow-fronted	P. auriceps	„	„ „	„
598. Parrot, Common Grey, or Jaco	Psittacus erythacus	„	W. Africa, Europe	W. T.
599. „ Illinois	P. pertinax	„	United States	W.
600. „ Mexican	P. Carolinensis	„	W. United States	„
601. „ Blue-fronted	P. Amazonicus	„	S. America (Amazons)	„
602. „ Great Blue and Yellow Macaw	P. ararauna	„	S. America (Brazil and Guiana)	W. T.
603. „ Anaca	Derotypus coronatus	„	S. America (Amazons)	W.
604. „ Maracana	Ara marakana	„	„ „	„
605. „ Siskin	Nauterna pygmæa	„	New Guinea	„
606. „ Long-billed	Nestor productus	„	Philip Island	„
607. „ Owl, Ground Parrot of the Colonists, the 'Kakapo' of the Natives	Stringops habroptilus	„	New Zealand	W. C.
608. Parrots without common English names	Conurus solstitialis	„	S. America (Demerara)	T.
609. Parrots without common English names	Coracopsis vaga	„	Madagascar	W.
610. Parrots without common English names	Trichoglossus Swainsoni	„	Australia	„
611. Partridge, Common, or Grey	Perdix cinerea	Rasores	Britain	W. T.

612.	„ Great Rock	Megaloperdix Tibetanus	„	Tibet	W.
613.	„ Chukor	Caccabis chukor	„	India	D. T.
614.	„	C. Græca	„	Syria and Palestine	T.
615.	„	Ortygornis gularis	„	India	W.
616.	Peacock, Common domestic	Pavo cristatus	„	India, Britain	D. T.
617.	Peccary, or Peccari, White-lipped	Dicotyles labiatus	Ungulata	S. America	W. T.
618.	„ Common Collared, or Tajaçu	D. torquatus	„	„	„
619.	Pekan, Fisher Cat, or Wood Shock	Martes Canadensis	Carnivora	New Brunswick	W.
620.	Pelican, Common	Pelecanus onocrotalus	Natatores	Asia and Africa, England and Ireland	W. C.
621.	„	P. erythrorynchus	„	N. America, St. Domingo, India	W. T.
622.	Penguin, King	Aptenodytes Patachonica	„	Macquarie Island	W.
623.	„ Blue	Eudyptula minor	„	New Zealand	W. C. T.
624.	„ or Child Bird	Spheniscus Humboldti	„	Peru	T.
625.	„ Rock-hopper of Sealers	Eudyptes chrysocoma	„	Tristan d'Acunha	W.
626.	Petrel, Dove	Prion turtur	„	New Zealand	W. C.
627.	Pheasant, Common	Phasianus Colchicus	Rasores	China, Britain	W. S-W. T.
628.	„ Golden	P. pictus	„	„ „	W. C.
629.	„ Argus	P. Argus	„	Siam, Sumatra, Malacca	W.
630.	„ Trogopan or Horned	Trogopan satyrus	„	India, Tibet, China	„
631.	„ Impey's	Lophophorus Impeyanus	„	India, (Himalayas)	„
632.	Pigeon, Common domestic, the Rock Pigeon, or Dove, including the Pouter, and other Breeds	Columba livia	„	Britain, Switzerland	W. T.
633.	„ Wood, Ring Dove, or Cushat	C. palumbus	„	Britain	„
634.	„ Courier, Carrier, or Homing	C. tabellaria	„	Asia Minor, Belgium, France	W. D. T.

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635. Pigeon, Passenger	Ectopistes migratorius	Rasores	N. America	W.
636. „ New Zealand, the 'Kuku' of the Natives	Carpophaga Novæ Zelandiæ	„	New Zealand	W. C.
637. „	C. rupestris	„	China	W.
638. „	C. ænas	„	Syria and Palestine	W. T.
639. Pike, or Jack, Common	Esox lucius	Malacopteri	Britain, Germany	W. C.
640. Pilot-Fish	Naucrates ductor	Acanthopteri	Mexico	„
641. Pipe or Bill-Fish	Sygnathus acus	Lophobranchii	Britain	„
642. Piraya or Pirai	Serrasalmo piraya	Malacopteri	Guiana	W.
643. Pisoti	Nasua fusca	Carnivora	Nicaragua	W. T.
644. Pitta (Bird)	Pitta brachyura	Insessores	Ceylon	W.
645. Plover, Golden, Yellow, or Green	Charadrius pluvialis	Grallatores	Britain	„
646. „ Ringed	C. hiaticula	„	„	„
647. Podargus (Bird)	Podargus humeralis	Insessores	Australia	„
648. Polecat, Fitchet, the 'Fumart' (or Foumart) of Scotland	Mustela putoria	Carnivora	Britain, N. America	„
649. Porcupine, Common Crested, Ground or Burrowing	Hystrix cristata	Rodentia	S. Europe, N. Africa	„
650. Porpoise or Porpesse, common	Phocæna communis	Cetacea	Britain, N. Atlantic, Mediterranean	W. C.
651. Prairie Dog, or Barking Squirrel (a Marmot)	Arctomys Ludovicianus	Rodentia	W. United States	W.
652. Praying Insects	Mantis religiosa	Orthoptera	S. France, Italy, Portugal	„
653.	M. precaria	„	S. Europe	„
654.	M. oratoria	„	Africa, Asia, Germany	„

655.	Ptarmigan, Common or Grey	Lagopus vulgaris	Rasores	Scotland, Norway	W. T.
656.	Puffin, Common	Fratercula arctica	Natatores	Britain	W.
657.	Puma, Cougar, or American Lion	Felis concolor	Carnivora	N. and S. America	W. T.
658.	Quagga	Equus Quagga	Ungulata	S. Africa	„
659.	Quail, Common	Coturnix communis	Rasores	Mediterranean countries	„
660.	„ Fighting	Semipodius pugnax	„	India, China	C.
661.	„ Virginian or Colin, the 'Ah! Bob White' of the settlers	Ortyx Virginiana	„	N. America	W. T.
662.	Rabbit, Common Domestic	Lepus cuniculus	Rodentia	Britain, New Zealand, Australia	W. or S-W. D. T.
663.	„	L. sylvaticus	„	N. America	W.
664.	„	L. artemisius	„	„	„
665.	Racoon, Common	Procyon lotor	Carnivora	„	W. T.
666.	Rail, Striped	Rallus Philippensis	Grallatores	New Zealand	W. C.
667.	Rat, Common, domestic or black	Mus rattus	Rodentia	Britain	W.
668.	„ Brown, Gray, or Norway	M. decumanus	„	Britain, China and Indo-China, British Columbia	W. C.
669.	„ Bandicoot, Malabar or Pig	M. giganteus	„	India and Ceylon	W.
670.	„ Pouched or Sand	Geomys bursarius	„	Canada	„
671.	„ Mole or Blind, the Podolian Marmot	Sphalax typhlus	„	S. Russia, and E. Asia	„
672.	„ Water (a Vole)	Arvicola amphibia	„	Europe, N. Asia	„
673.	Ratel or Honey Badger	Mellivora Capensis	Carnivora	S. Africa	W. T.
674.	Raven, Common	Corvus corax	Insessores	Scotland	„
675.	„ Pied	C. leucophæus	„	Faroe Islands	W.
676.	Red Bird or Virginian Nightingale	Cardinalis Virginianus	„	E. N. America.	„
677.	Red poll (or pole), Common or lesser	Fringilla rufescens	„	Europe	„
678.	„ Greater	F. cannabina	„	Britain	W. C.

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679. Redstart	Ruticilla phœnicura	Insessores	Britain	C. T.
680. Regent Bird	Sericulus melinus	„	Australia	W.
681. Reindeer, including the Caribou	Cervus tarandus	Ungulata	Arctic N. America and Europe, Iceland, Greenland	W. D. T.
682. Rhinoceros, Common Indian	Rhinoceros Indicus	„	India, England	W. C.
683. „ Two-horned or Black, the 'Borrelé' of the Natives and Colonists	R. Africanus	„	S. Africa	„
684. 685. Rifle-Bird	Epimachus Victoriæ E. magnifica	Insessores	New Guinea	W.
686. Rifleman (Bird)	Acanthisitta chloris	„	New Zealand	„
687. Robin Redbreast	Rubecula familiaris	„	Britain	W. C.
688. „ New Zealand	Miro longipes	„	New Zealand	W. T.
689. „	M. albifrons	„	„	„
690. Rook, Common	Corvus frugilegus	„	Britain	„
691. Rorqual, Northern, or Razor-back, the 'Fin-fish' of Whalers	Balænoptera antiquorum	Cetacea	N. Atlantic.	W.
692. Ruff, Common	Machetes pugnax	Grallatores.	Britain	W. C.
693. Saddleback (bird)	Creadion carunculatus	Insessores	New Zealand	W.
694. Salamander, Black	Salamandra atra	Amphibia	S. Germany, Swiss Alps	„
695. Salmon, Common	Salmo salar	Malacopteri	Britain	„
696. Sandpiper, Common, or Summer Snipe	Tringa hypoleucos	Grallatores.	Scotland	„
697. „ Purple Stint	T. maritima	„	E. Greenland	„
698. Scorpion, Common	Scorpio Europæus	Arachnida	S. Europe	W. T. C.

699. 700. 701.	Sea Bear or Lion (a Seal)	Otaria ursina	Carnivora	Cape Horn	„
		O. leonina	„	N. and S. Pacific, France, England	„
		O. Stelleri.	„	Kamschatka, California	W. C.
702.	Sea Horse	Hippocampus brevirostris	Lophobranchii	Germany, England	C.
703.	Seal, Common	Phoca vitulina	Carnivora	N. Atlantic, Britain, France	W. T.
704.	„ Monk	Monachus albiventer	„	Mediterranean, Madeira	W.
705.	„ Bladder-Nose or Hooded	Cystophora cristata	„	N. Atlantic, Greenland	„
706.	„ Elephant or Proboscis, the Sea Elephant	Macrorhinus proboscideus	„	Juan Fernandez, Chili	„
707.	Sepiola	Sepiola Rondeletii	Cephalopoda	England	C.
708.	Shag, Spotted	Phalacrocorax punctatus	Natatores	New Zealand.	W.
709.	„ Green Cormorant	P. graculus	„	Shetland	„
710.	Shark, Blue	Carcharias glaucus	Plagiostomi	N. Atlantic, Mediterranean, England	„
711.	„ White	C. vulgaris	„	Mediterranean	„
712.	Sheep, Common Domestic, including the Merino and other breeds	Ovis aries	Ungulata	Britain, New Zealand, Queensland, Syria, Palestine, India, Iceland, France, Spain, Greece	W. S-W. D. T.
713.	„ Bearded or Aoudad	O. tragelaphus	„	N. Africa (Barbary)	W.
714.	„ Mountain or Argali	O. argali	„	Central Asia	„
715.	„ The Blue Goat ('Ku-ku-Yaman') of the Mongols	O. Burrhel.	„	„	„
716.	Sheldrake, Shelldrake, or Shieldrake, the Common Burrow Duck	Tadorna vulpanser	Natatores	Britain	W. T.
717.	„ New Zealand, the 'Paradise Duck' of the Colonists	Casarca variegata	„	New Zealand, England	W. T. C.
718.	Shrew, Algerine or Elephant	Macroscelides Rozeti	Insectivora.	N. Africa	W. T.
719.	Shrike, Redback	Lanius collaris	Insessores	England	W.
720.	„ Bush	Vanga curvirostris	„	Madagascar	„
721.	Shrimp, Common	Crangon vulgaris	Crustacea	Britain	„

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722. Silurus, Sly, Sheat Fish, or Shaden	Silurus glanis	Malacopteri	Danube and Elbe	W.
723. Silver-eye, 'Wax-eye' of the Settlers	Zosterops lateralis	Insessores	New Zealand	„
724. Siskin, Pine	Carduelis spinus	„	New Brunswick	C.
725. Skate, or Ray, Common Thornback	Raia clavata	Plagiostomi	England	W. T.
726. „ Sand or Spotted, the Homelyn	R. maculata	„	„	C.
727. Skunk, Common	Mephitis Americana	Carnivora	New Brunswick	W. T.
728. Sloth, Three-toed, or Ai	Bradypus tridactylus	Edentata	Tropical S. America	W.
729. Slug, Common, Garden or Black	Limax ater	Pulmonifera	Scotland	„
730. „	L. arborum	„	Britain	„
731. Smelt	Osmerus viridescens.	Malacopteri	New Brunswick	„
732. Snail, Common	Helix aspersa	Pulmonifera	Britain	„
733. Snake, Spectacled or Hooded, the Cobra da Capello	Naja tripudians.	Ophidia	India, Ceylon	W. C. T.
734. „ Tree	Bucephalus viridis	„	S. Africa	W.
735. „ 'Boomslange' of the Cape Colonists.	B. Capensis	„	„	„
736. „ Green Tree	Passerita nycterizans	„	India	„
737. „ Black	Coluber constrictor	„	N. America	W. T.
738. „ Common, Ringed, or Grass	C. natrix	„	England	„
739. „	C. Couperi	„	United States (Georgia)	W.
740. „	C. flagelliformis	„	N. America	„

741.	„	Philadryas viridissimus	„	W. Indies	„
742.	Snipe, Common	Scolopax gallinago	Grallatores	Britain	W.T.
743.	„ Wilson's	S. Wilsoni	„	United States	W.
744.	Sparrow, Common House, or Domestic	Passer domesticus	Insessores	England, Australia	„
745.	„ Tree	P. montanus	„	Britain	W.C.
746.	„	P. stultus	„	S. Europe, and N. Africa	W.
747.	„ Song	Zonotrichia melodia	„	N. America	„
748.	„ Java	Padda oryzivora	„	Java, Mauritius, St. Helena, Britain	W.T.
749.	„ Republican	Ploceus Abyssinicus	„	Africa	W.
750.	„ Hedge warbler or Accentor, the Dunnock	Accentor modularis	„	Britain	„
751.	„ China	Pyrgita montana	„	China, Britain	W.T.
752.	„	P. salicicola	„	N. Africa, Spain	W.
753.	„	P. melanura	„	S. Africa	„
754.	Spider, Common Garden	Epeira diadema	Arachnida	Britain	„
755.	„ House	Aranea domestica	„	„	„
756.	„ Gossamer	A. obtectrix	„	„	„
757.	„ Jumping	Salticus scenicus	„	„	„
758.	„ Nestmaking	Atypus Sulzeri	„	S. England	„
759.	„ Trap-door	Mygale cementaria	„	S. France	„
760.		Nemesia eleanora	„	S. Europe	„
761.		Cteniza nidulans	„	W. Indies	„
762.	„	Lycosa armentata	„	Britain	„
763.		Galeodes intrepida	„	Spain	„
764.		Calliethera histrionica	„	England	„
765.	Spio	Spio seticornis	Annelida	Britain	C.
766.	Springbok	Antilope euchore	Ungulata	S. Africa	W.
767.	Squid, Common, Calamary, or Sleeve Fish	Loligo vulgaris	Cephalopoda	England	W.C.
768.	„ Little	L. media	„	„	C.
769.	Squirrel, Common	Sciurus vulgaris	Rodentia	Scotland	W.T.
770.	„ Red	S. Hudsonius	„	N. America	W.

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722. Silurus, Sly, Sheat Fish, or Shaden	Silurus glanis	Malacopteri	Danube and Elbe	W.
723. Silver-eye, 'Wax-eye' of the Settlers	Zosterops lateralis	Insessores	New Zealand	„
724. Siskin, Pine	Carduelis spinus	„	New Brunswick	C.
725. Skate, or Ray, Common Thornback	Raia clavata	Plagiostomi	England	W. T.
726. „ Sand or Spotted, the Homelyn	R. maculata	„	„	C.
727. Skunk, Common	Mephitis Americana	Carnivora	New Brunswick	W. T.
728. Sloth, Three-toed, or Ai	Bradypus tridactylus	Edentata	Tropical S. America	W.
729. Slug, Common, Garden or Black	Limax ater	Pulmonifera	Scotland	„
730. „	L. arborum	„	Britain	„
731. Smelt	Osmerus viridescens.	Malacopteri	New Brunswick	„
732. Snail, Common	Helix aspersa	Pulmonifera	Britain	„
733. Snake, Spectacled or Hooded, the Cobra da Capello	Naja tripudians.	Ophidia	India, Ceylon	W. C. T.
734. „ Tree	Bucephalus viridis	„	S. Africa	W.
735. „ 'Boomslange' of the Cape Colonists.	B. Capensis	„	„	„
736. „ Green Tree	Passerita nycterizans	„	India	„
737. „ Black	Coluber constrictor	„	N. America	W. T.
738. „ Common, Ringed, or Grass	C. natrix	„	England	„
739. „	C. Couperi	„	United States (Georgia)	W.
740. „	C. flagelliformis	„	N. America	„

741. „	Philadryas viridissimus	„	W. Indies	„
742. Snipe, Common	Scolopax gallinago	Grallatores	Britain	W.T.
743. „ Wilson's	S. Wilsoni	„	United States	W.
744. Sparrow, Common House, or Domestic	Passer domesticus	Insessores	England, Australia	„
745. „ Tree	P. montanus	„	Britain	W.C.
746. „	P. stultus	„	S. Europe, and N. Africa	W.
747. „ Song	Zonotrichia melodia	„	N. America	„
748. „ Java	Padda oryzivora	„	Java, Mauritius, St. Helena, Britain	W.T.
749. „ Republican	Ploceus Abyssinicus	„	Africa	W.
750. „ Hedge warbler or Accentor, the Dunnock	Accentor modularis	„	Britain	„
751. „ China	Pyrgita montana	„	China, Britain	W.T.
752. „	P. salicicola	„	N. Africa, Spain	W.
753. „	P. melanura	„	S. Africa	„
754. Spider, Common Garden	Epeira diadema	Arachnida	Britain	„
755. „ House	Aranea domestica	„	„	„
756. „ Gossamer	A. obtectrix	„	„	„
757. „ Jumping	Salticus scenicus	„	„	„
758. „ Nestmaking	Atypus Sulzeri	„	S. England	„
759. „ Trap-door	Mygale cœmentaria	„	S. France	„
760. „ Trap-door	Nemesia eleanora	„	S. Europe	„
761. „ Trap-door	Cteniza nidulans	„	W. Indies	„
762. „	Lycosa armentata	„	Britain	„
763. „	Galeodes intrepida	„	Spain	„
764. „	Calliethera histrionica	„	England	„
765. Spio	Spio seticornis	Annelida	Britain	C.
766. Springbok	Antilope euchore	Ungulata	S. Africa	W.
767. Squid, Common, Calamary, or Sleeve Fish	Loligo vulgaris	Cephalopoda	England	W.C.
768. „ Little	L. media	„	„	C.
769. Squirrel, Common	Sciurus vulgaris	Rodentia	Scotland	W.T.
770. „ Red	S. Hudsonius	„	N. America	W.

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771. Squirrel, American, or Carolina Gray	S. Carolinensis	Rodentia	N. America	W.
772. „ Northern Gray and Black	Sciurus leucotis	„	Lapland	„
773. Star or Star-fish, Brittle	Ophiocoma neglecta	Echinodermata	Britain	W. C.
774. „ „	O. rosula	„	S. England	„
775. „ Spiny	Uraster glacialis	„	England	C.
776. „ Feather	Comatula rosacea	„	S. England	„
777. Starling, Common	Sturnus vulgaris	Insessores	Britain	W. T. C.
778. „	S. curæus	„	Central America	W.
779. „ Field or American, the Meadow Lark	Sturnella Ludoviciana	„	United States	„
780. Stickleback, Smooth-tailed	Gasterosteus leiurus	Acanthopteri	Britain	W. C.
781. „ Rough-tailed or Three-spined	G. trachurus	„	„	„
782. Stone-chat, Flesh-coloured	Saxicola Isabellina	Insessores	Central Asia (Mongolia)	W.
783. Stork, Common or White	Ciconia alba	Grallatores	Holland, Germany, Holstein, England, Syria and Palestine	W. T. C.
784. Surikate	Viverra suricata	Carnivora	S. Africa, England	„
785. Swallow, British Chimney	Hirundo rustica	Insessores	Britain	W.
786. „ Cape	H. Capensis	„	S. Africa	„
787. „ Australian Chimney	H. frontalis	„	Australia	„
788. „ Cliff or Republican	H. fulva	„	N. America (Rocky Mountains, E. United States)	„

789. „	H. cahirica	„	Syria and Palestine	„
790. „	H. domestica	„		
791. Swan, Wild, Hooper, Whistling, or Elk	Cygnus ferus	Natatores	N. Europe and Asia	„
792. „ Black	C. atratus	„	Australia, Britain	W. S-W.
793. Swift, Common	Cypselus murarius	Insessores	Scotland	W.
794. „ Little Chimney, or American	Chætura pelasgica	„	N. America	„
795. „ Palm	Tachornis phœnicobœa	„	Jamaica	„
796. Tacco (Bird, a Cuckoo)	Saurothera vetula	Scansores	„	„
797. Tailor Bird	Sylvia sutoria	Insessores	India and Indian Archipelago	„
798. Talegalla, Brush or Wattled Turkey, the New Holland Vulture	Talegalla Lathami	Rasores	Australia	„
799. Tanager (Bird)	Ramphocœlus passerinii	Insessores	Nicaragua	„
800. Tapir, American	Tapirus Americanus	Ungulata	S. America	W. T.
801. „ Malayan	T. Indicus	„	Malacca and Sumatra	„
802. Tern, Common or Great, Sea Swallow, the 'Pickietar' of the North of Scotland	Sterna hirundo	Natatores	Britain	W.
803. Thrush, Missel	Turdus viscivorus	Insessores	Europe	„
804. „ Song, the 'Throstle' or 'Mavis' of Scotland	T. musicus	„	Scotland	W.
805. „ Migratory, or Migratory Robin	T. migratorius	„	New Brunswick	W. C.
806. „	T. felivox	„	N. America	„
807. „ 'Piopio' of the Maoris	Turnagra Hectori	„	New Zealand	W. C. T.
808. „	T. crassirostris	„		
809. Tiger	Felis tigris	Carnivora	S. Asia	W. T.
810. Tit, Pied	Myiomora toitoi	Insessores	New Zealand	W.
811. Titlark, Kitlark, or Meadow Pipit	Alauda pratensis	„	England	„
812. Titmouse, Blue, or Tomtit	Parus cœruleus	„	„	W. C.

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813. Titmouse, Black or Great, the Ox-eye	P. major	Insessores	Britain	W. C.
814. „ Crested	Parus cristatus	„	Scotland	W.
815. Toad, Common	Bufo vulgaris	Amphibia	Britain	W. T.
816. „ Obstetric	B. obstetricans	„	Europe (Portugal)	W.
817. „	B. Americanus	„	N. America	„
818. Tortoise, Common Land	Testudo græca	Chelonia	Spain, Italy, Greece	W. C. T.
819. „	Emys Europæus	„	S. and E. of Europe	W. C.
820. „	Xerobates polyphemus	„	United States (Georgia)	W.
821. Toucan	Ramphostos Toco	Scansores	Brazil	W. C. T.
822. Trogon (Bird)	Trogon massena			
823. Trogon (Bird)	T. atricollis	„	Nicaragua	W.
824. Trogon (Bird)	T. caligatus			
825. Trout, Common River	Salmo fario	Malacopteri	Britain	„
826. 'Tsetse' Fly	Glossina morsitans	Diptera	Central and S. Africa	„
827. 'Tui' (Bird), Toi, Toui, or Tui-ko, the Poe Bird of the Maoris, the Parson Bird or Mocking Bird of the Colonists	Prosthemadera Novæ Zelandiæ	Insessores	New Zealand	W. C.
828. Turkey, Common Domestic	Meleagris gallopavo	Rasores	Britain, United States	W. S-W. D. T.
829. „ American or Honduras	M. ocellata		N. America	W.
830. Turnstone	Strepsilas interpres	Grallatores	Scotland	„
831. Turtle, Green or Edible	Chelonia mydas	Chelonia	W. Indies, I. of Ascension	„
832. Tyrant Shrike, Flycatcher, or King Bird	Tyrannus Carolinensis	Insessores	New Brunswick	„
833. Tyrant Shrike, Flycatcher, or King Bird	T. intrepidus		N. America	„

834. 835.	Vampire, or Spectre Bat	Phyllostoma spectrum Alectops ater	Cheiroptera	S. America (Amazons)	„
836.	Vicuña or Vicugna	Auchenia Vicuña	Ungulata	S. America	„
837.	Viper, Common, the 'Adder' of Scotland	Vipera communis	Ophidia	Britain	„
838.	Viro, Blueheaded	Viro solitarius	Insessores	United States	„
839.	Viscacha, Vishaca, or Biscacto	Lagostomys Viscacia	Rodentia	S. America	„
840.	Vison, or Black Mink	Mustela Vison	Carnivora	New Brunswick	W. T.
841.	Viviparous Fish	Ditrema argenteum	Acanthopteri	British Columbia	W.
842. 843.	Vole	Arvicola economica A. arvalis	Rodentia „	Siberia N. Europe and Asia	„ „
844.	Vulture, Griffin or Tawny, the Eagle of Scripture	Vultur fulvus	Raptores	Syria and Palestine, Swiss Alps and Pyrenees	„
845.	„ Redheaded, or Turkey Buzzard	Cathartes aurea	„	United States	„
846.	„ Carrion	C. iota	„	N. America	„
847.	„ Urubu, or Black Turkey	C. atrata	„	W. Indies, S. America (Amazons)	„
848.	„ Scavenger or Egyptian	Neophron pecnopterus	„	Egypt	„
849.	„ Snow	Gyps nivicola	„	Tibet	„
850.	Wagtail, Pied	Motacilla Yarrellii	Insessores	Britain	„
851.	„ Gray	M. boarula	„	Britain, France	„
852.	Wallaby, Rock	Macropus penicillatus	Marsupialia	New South Wales	„
853.	Walrus, Morse, or Sea Horse	Trichecus rosmarus	Carnivora	Arctic Seas	„
854.	Wapiti	Cervus Canadensis	Ungulata	N. America	„
855.	Warbler, Sedge	Sylvia phragmites	Insessores	Britain	„
856.	„ Reed	S. arundinacea	„	S. England, Holland	„
857.	„ Willow, or Willow Wren	S. trochilus	„	Britain	W. C.
858.	„ Grey	S. cinerea	„	„	W.
859.	„ Yellow	Sylvicola æstiva	„	N. America	„
860.	„ New Zealand	Gerygone flaviventris	„	New Zealand	„

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861. Warbler, Grasshopper, or Grasshopper Lark	Locustella nævia	Insessores	Britain	W.
862. Wasp, Common	Vespa vulgaris	Hymenoptera	„	„
863. „	V. Germanica	„	Europe	„
864. „	Polistes Gallica.	„	England, France, Corfu	W. T.
865. „	P. carnifex	„	Nicaragua	W.
866. „	Pomphilus polistoides	„	„	„
867. „	Monedula Surinamensis	„	Nicaragua, Brazil	„
868. Wattle Bird	Anthochæra carunculata	Insessores	Australia	„
869. Weasel, Common	Mustela vulgaris	Carnivora	Scotland	W. C. T.
870. Weaver Bird, Philippine, the Philippine Grosbeak, or Baya Bird	Ploceus Philippinus	Insessores	Philippine Islands, India	„
871. „ Social or Republican	P. socius	„	S. Africa	W.
872. „	Textor erythrorynchus	„	„	„
873. Whale, Common, Right, or Greenland	Balæna mysticetus	Cetacea	Arctic Seas	„
874. „ Sperm or Spermaceti, the Common Cachalot	Catodon macrocephalus	„	N. and S. Pacific	„
875. „ Caaing	Phocæna globiceps	„	Orkney and Shetland, Iceland	„
876. Wheatear, Common	Saxicola œnanthe	Insessores	Britain	„
877. Whidah, Whydah or Widow Bird or Finch	Vidua paradisea	„	Tropical Africa	C.
878. Whinchat, or Furze-chat	Saxicola rubetra	„	Britain	W. C.
879. Whip-poor-will (a Goat-sucker)	Caprimulgus vociferus	„	N. America	W.

880. Whip-Tom-Kelly	Parus bicolor	„	„	„	
881. Whitehead, the 'Popotea' (or 'Popoketea') of the Maoris	Orthonyx albicilla	„	New Zealand	„	
882. Whitethroat, Greater	Sylvia rufa	„	Europe	W. C. T.	
883. Woodcock, Common	Scolopax rusticola	Grallatores	Britain	W.	
884. „ American	Microptura Americana	„	N. America	„	
885. Wood-hen, the 'Weka' of the Maoris (a Rail)	Ocyodromus fuscus	„	New Zealand	W. C.	
886.	O. australis				
887.	O. Earli				
888. Woodpecker, Green	Picus viridis	Scansores	Britain	W.	
889. „ Ivory-billed	P. principalis	„	N. America (N. & S. Carolina and Mexico)	„	
890. „	P. familiaris	„	N. America	„	
891. „ Ant-eating	Melanerpes formicivorus	„	California	„	
892. „	Celeus castaneus	„	Nicaragua	„	
893. „	Centrurus Pucherani	„	„	„	
894. Wolf, Common	Canis lupus	Carnivora	N. America, Central Europe (Swiss Alps, Pyrenees, Russia)	W. T.	
895. „ Gray	C. griseus	„	N. America	W.	
896. „ Prairie, the 'Coyote' of Mexico	C. latrans	„	„	„	
897. „ Tibetan	C. chanco	„	Tibet	„	
898. „	C. pallipes	„	N. India	„	
899. Wolf-fish, Common, Cat-fish, or Sea Cat	Anarrhichas lupus	Acanthopteri	N. Atlantic	„	
900. Wombat, the 'Native Badger' of the Colonists	Phascolomys Wombata	Marsupialia	Australia and Tasmania	W. C.	
901. Worm, Common Earth	Lumbricus terrestris	Annelida	Britain	W.	
902. „ „ Dew	L. gigas	„	„	„	
903. „ „ Blind or Slow	Anguis fragilis	Lacertilia	„	„	
904. „ „ Glow	Lampyris noctiluca	Coleoptera	„	„	
905. Wrasse, Cuckoo	Labrus variegatus	Acanthopteri	S. England	C.	

ENUMERATION OF SPECIES—*continued.*

I. Common Name, including the English, Colonial, Native, Foreign, or other popular designation	II. Scientific, Latin, or Zoological Name of Genus and Species	III. Zoological Class or Order	IV. Country in which Habits observed, including that in which animals are captive or domesticated	V. Circumstances under which Habits observed
906. Wren, Common	Troglodytes parvulus	Insessores	Britain	W. C.
907. „ House	T. ædon	„	United States	W.
908. „ Golden crested	Regulus cristatus	„	British Islands	„
909. Wryneck, Common, or Cuckoo's Mate	Yunx torquilla	Scansores	S. England.	W. T.
910. Yak	Bos grunniens	Ungulata	Tibet	W. D. T.
911. Yellow Hammer or Bunting, the 'Yoldrin' or 'Yite' of Scotland	Emberiza citrinella	Insessores	Britain, France, Italy	W.
912. Zebra, Common	Equus Zebra	Ungulata	S. Africa	W. C. T.
913. „ Burchell's	E. Burchellii	„	„	W. C.
914. Zic-zac or Zig-zag (bird, a Plover)	Charadrius Ægyptiacus	Grallatores	N. Africa	W.

II.—Enumeration of Genera represented: including the Species.

The Latin or Scientific Names only are given.—Arrangement Alphabetical.

Genera	Species	References to Catalogue I. (of Species)
1. Acanthias	Vulgaris.	259
2. Acanthisitta	Chloris.	686
3. Accentor	Modularis.	750
4. Accipiter	Nisus.	393
5. Acephalocystis	Globulosa.	415
6. Acherontia	Atropos.	541
7. Acheta	1. Campestris.	220
	2. Domestica.	221
8. Actinia	1. Crassinervis.	10
	2. Mesembryanthemum.	9
9. Actinophrys	Sol.	13
10. Adamsia	Palliata.	8
11. Agama	Chlamydosaurus.	1
12. Alauda	1. Alpestris.	441
	2. Arvensis.	440
	3. Cristata.	442
	4. Pratensis.	811
13. Alectops	Ater.	835
14. Alligator	Mississippensis.	6
15. Amœba	Radiosa.	14
16. Anarrhichas	Lupus.	899
17. Anas	1. Americana.	273
33. Aquila, (*cont.*)	2. Fulvescens.	282
34. Ara	Marakana.	604
35. Aranea	1. Domestica.	755
	2. Obtectrix.	756
36. Arctomys	1. Alpinus.	479
	2. Bobac.	482
	3. Ludovicianus.	651
	4. Marmota.	478
	5. Monax.	480
	6. Robustus.	481
37. Ardea	1. Cinerea.	397
	2. Herodias.	398
38. Arvicola	1. Amphibia.	672
	2. Arvalis.	843
	3. Economica.	842
	4. Hispida.	548
	5. Socialis.	549
39. Astur	Palumbarius.	362
40. Ateles	1. Arachnoides.	515
	2. Beelzebub.	513
	3. Paniscus.	512
	4. Pentedactylus.	514

	2. Boschas.	268
	3. Ferina.	272
	4. Galericulata.	270
	5. Mollissima.	269
	6. Vallisneria.	271
18. Anguis.	Fragilis.	903
19. Anobis.	Cristatellus.	458
20. Anobium	1. Striatum.	95
	2. Tessellatum.	96
21. Anser	1. Canadensis.	351
	2. Ferus.	350
	3. Leucopis.	353
	4. Sinensis.	352
22. Anthocapa	Papaveris.	91
23. Anthochæra	Carunculata.	868
24. Anthornis	1. Melanocephala.	119
	2. Melanura.	118
25. Anthus	Novæ Zelandiæ.	364
26. Antilope	1. Dorcas.	330
	2. Euchore.	766
	3. Furcifer.	55
	4. Gnu.	340
	5. Hodgsoni.	56
	6. Oreas.	289
	7. Picta.	562
	8. Picticauda.	57
	9. Rupicapra.	184
27. Aphis	Radicum.	463
28. Apis	Mellifica.	89
29. Aporia	Cratægi.	165
30. Aptenodytes	Patachonica.	622
31. Apteryx	Mantelli.	435
32. Aptura	Iris.	163
33. Aquila	1. Chrysäetos.	281
41. Ateuchus	1. Cicatricosus.	114
	2. Pilularius.	99
42. Athene	1. Cunicularia.	587
	2. Noctua.	586
	3. Socialis.	588
43. Atta	1. Agricola.	19
	2. Barbara.	17
	3. Cephalotes.	25
	4. Megacephela.	16
	5. Providens.	18
	6. Structor.	15
44. Atypus	Sulzeri.	758
45. Auchenia	1. Huanaco.	371
	2. Lama.	437
	3. Paco.	7
	4. Vicuña.	836
46. Aurelia	Aurita.	490
47. Balæna	Mysticetus.	873
48. Balænoptera	Antiquorum.	691
49. Barita	Tibicen.	235
50. Basilius	Amboinensis.	76
51. Bassoris	Astuta.	177
52. Birgus	Latro.	214
53. Blatta	Orientalis.	202
54. Blennius	Pholis.	129
55. Boa	1. Constrictor.	130
	2. Imperator.	131
56. Bombus	Muscorum.	88
57. Bombycilla	Carolinensis.	181
58. Bos	1. Bison.	121
	2. Bubalus.	145
	3. Caffer.	144
	4. Gavæus.	329
	5. Grunniens.	910

ENUMERATION OF GENERA—*continued.*

Genera	Species	References to Catalogue I. (of Species)	Genera	Species	References to Catalogue I. (of Species)
58. Bos, (*cont.*) . . .	6. Indicus.	150	86. Carpophaga . .	Novæ Zelandiæ.	636
	7. Taurus.	590	87. Casarca . . .	Variegata.	717
	8. Urus.	122	88. Castor . . .	1. Canadensis.	86
59. Botaurus . . .	1. Pœciloptilus.	124		2. Fiber.	85
	2. Stellaris.	123	89. Casuarius . . .	Galeatus.	174
60. Bowerbankia . .	Imbricata.	139	90. Cathartes . . .	1. Atrata.	847
61. Bradypus . . .	Tridactylus.	728		2. Aurea.	845
62. Bromius . .	Vitis.	108		3. Iota.	846
63. Bubo	Maximus.	585	91. Catodon . . .	Macrocephalus.	874
64. Bucephalus . . .	1. Capensis.	735	92. Cavia . . .	Cobaya.	375
	2. Viridis.	734	93. Cebus . . .	1. Azaræ.	535
65. Bufo	1. Americanus.	817		2. Capucinus.	529
	2. Obstetricans.	816		3. Fatuellus.	528
	3. Vulgaris.	815	94. Celeus . . .	Castaneus.	892
66. Buphaga . . .	Africana.	117	95. Centrurus . . .	Pucherani.	893
67. Buteo	1. Borealis.	167	96. Cephalopterа . .	Massena.	252
	2. Vulgaris.	166	97. Cereopsis . . .	Novæ Hollandiæ.	354
68. Cacatua . . .	1. Galerita.	198	98. Cercopithecus . .	1. Cynosurus.	497
	2. Leadbetteri.	199		2. Diana.	501
69. Caccabis . . .	1. Chukor.	613		3. Fuliginosus.	502
	2. Græca.	614		4. Kees.	60
70. Cairina . . .	Moschata.	275		5. Mona.	499
71. Calliethera . . .	Histrionica.	764		6. Ruber.	500
72. Callithrix . . .	1. Personatus.	519		7. Sabæus.	61
	2. Sciureus.	521	99. Cervus .	1. Alces.	538
	3. Torquatus.	520		2. Axis.	246

73. Camelopardalis	Giraffa.	337
74. Camelus	1. Bactrianus.	168
	2. Dromedarius.	267
75. Canis	1. Anglicus.	257
	2. Aureus.	419
	3. Azaræ.	318
	4. Chanco.	897
	5. Corsac.	209
	6. Dingo.	255
	7. Familiaris.	254
	8. Griseus.	895
	9. Latrans.	896
	10. Lupus.	894
	11. Pallipes.	898
	12. Sagax.	258
	13. Venaticus.	256
76. Cantharus	Lineatus.	143
77. Capra	1. Ægagrus.	342
	2. Angorensis.	344
	3. Hircus.	341
	4. Ibex.	343
	5. Mambrica.	345
78. Caprimulgus	1. Carolinensis.	192
	2. Europæus.	346
	3. Vociferus.	879
79. Capromys	Pilorides.	180
80. Carabus	Intricatus.	112
81. Carcharias	1. Glaucus.	710
	2. Vulgaris.	711
82. Carcinus	Mœnas.	211
83. Cardinalis	Virginianus.	676
84. Carduelis	1. Communis.	348
	2. Spinus.	724
85. Carpodacus	Pithagineus.	153

100. Ceryle	433
101. Cetonia	94
102. Chætura	794
103. Chætodon	62
104. Chameleo	185
105. Charadrius	914
	646
	263
	645
106. Cheiromys	68
107. Chelonia	831
108. Chiasognathus	115
109. Chimæra	402
110. Chinchilla	191
111. Chlamydera	141
112. Chlamydosaurus	455
113. Chrysococcyx	237
114. Chrysopa	311
	312
115. Cicada	193
116. Cicindela	105
117. Ciconia	783
118. Cimex	146
119. Cinclus	579
120. Circus	391

3. Canadensis.	854
4. Capreolus.	244
5. Dama.	248
6. Elaphus.	245
7. Macrotis.	250
8. Porcinus.	247
9. Strongyloceros.	295
10. Tarandus.	681
11. Virginianus.	249
Halcyon.	433
Aurata.	94
Pelasgica.	794
Rostratus.	62
Africanus.	185
1. Ægptiacus.	914
2. Hiaticula.	646
3. Morinellus.	263
4. Pluvialis.	645
Madagascariensis.	68
Mydas.	831
Grantii.	115
Monstrosa.	402
Laniger.	191
Maculata.	141
Kingii.	455
Lucidus.	237
1. Perla.	311
2. Vulgaris.	312
Plebeia.	193
Campestris.	105
Alba.	783
Lectularius.	146
Aquaticus.	579
Gouldi.	391

ENUMERATION OF GENERA—*continued.*

Genera	Species	References to Catalogue I. (of Species)	Genera	Species.	References to Catalogue I. (of Species)
121. Claviger	1. Duvalii.	103	157. Dasyprocta.	Agouti.	3
	2. Foveolatus.	109	158. Dasyurus	1. Ursinus.	251
122. Clupea	Harenga.	401		2. Viverrimus.	176
123. Cnethocampa	Processionea.	544	159. Delphinus	Delphis.	261
124. Coccinella	Bipunctata.	106	160. Derotypus	Coronatus.	603
125. Coccothraustes	Vulgaris.	392	161. Dicotyles	1. Labiatus.	617
126. Coccus	Cacti.	200		2. Torquatus.	618
127. Coluber	1. Constrictor.	737	162. Dicrurus	Macrocerus.	430
	2. Couperi.	739	163. Didelphys	Virginiana.	566
	3. Flagelliformis.	740	164. Diomedea	1. Exulans.	4
	4. Natrix.	738		2. Melanophrys.	5
128. Colobus	Guereza.	507	165. Dipus.	1. Ægypticus.	424
129. Columba	1. Ænas.	638		2. Alactaga.	425
	2. Livia.	632	166. Ditrema	Argenteum.	841
	3. Palumbus.	633	167. Dolichotis	Patachonica.	179
	4. Rupestris.	637	168. Dromaius	Novæ Hollandiæ.	296
	5. Tabellaria.	634	169. Eciton	1. Hamata.	22
130. Colymbus	1. Glacialis.	460		2. Predator.	21
	2. Septentrionalis.	253	170. Ectopistes	Migratorius.	635
131. Colnocera	Attæ.	107	171. Eledone	Cirrhosa.	292
132. Comatula	Rosacea.	776	172. Elephas	1. Africanus.	293
133. Conger	Vulgaris.	205		2. Indicus.	294
134. Conurus	Solstitialis.	608	173. Emberiza	1. Cia.	154
135. Corvus	1. Americanus.	229		2. Citrinella.	911
	2. Corax.	674		3. Hortulana.	574
	3. Cornix.	228		4. Nivalis.	156

	4. Corone.	227
	5. Frugilegus.	690
	6. Leucophæus.	675
	7. Monedula.	243
	8. Ossifragus.	230
	9. Splendens.	231
136. Coturnix	Communis.	659
137. Cracticus	Picatus.	472
138. Crangon	Vulgaris.	721
139. Crax	Alector.	240
140. Creadion	Carunculatus.	693
141. Crex	Pratensis.	218
142. Cricetus	Vulgaris.	384
143. Crocodilus	1. Acutus.	223
	2. Vulgaris.	222
144. Crotophaga	Ani.	126
145. Cteniza	Nidulans.	761
146. Cucullia	Verbasci.	543
147. Culex	Canorus.	236
148. Culex	Pipiens.	339
149. Cygnus	1. Atratus.	792
	2. Ferus.	791
150. Cynocephalus	1. Babouin.	72
	2. Hamadryas.	69
	3. Leucophæus.	71
	4. Maimon.	476
	5. Porcarius.	70
	6. Sphinx.	73
151. Cynopithecus	Niger.	508
152. Cyprinus	Auratus.	349
153. Cypselus	Murarius.	793
154. Cystophora	Cristata.	705
155. Dacelo	Gigantea	420
156. Damalis	Senegalensis.	58

174. Emys		
175. Epeira		
176. Epimachus		
177. Equus	5. Schœniculus.	155
	Europæus.	819
	Diadema.	754
	1. Magnifica.	685
	2. Victoriæ.	684
	1. Asinus.	66
	2. Burchellii.	913
	3. Caballus.	408
	4. Onager.	67
	5. Quagga.	658
	6. Zebra.	912
178. Erinaceus	Europæus.	395
179. Esox	Lucius.	639
180. Eudynamis	Taitensis.	238
181. Eudyptes	Chrysocoma.	625
182. Eudyptula	Minor.	623
183. Eupodotis	Edwardsi.	157
184. Falco	1. Æsalon.	492
	2. Islandicus.	299
	3. Laniarius.	300
	4. Peregrinus.	298
	5. Washingtonii.	301
185. Felis	1. Caracal.	172
	2. Catus.	175
	3. Concolor.	557
	4. Jubata.	187
	5. Leo.	453
	6. Pardalis.	563
	7. Pardus.	451
	8. Onça.	421
	9. Tigris	809
186. Fiber	Zibethicus.	553
187. Forficula	Auricularia.	287
188. Formica	1. Flava.	30

ENUMERATION OF GENERA – *continued.*

Genera	Species	References to Catalogue I. (of Species)	Genera	Species	References to Catalogue I. (of Species)
188. Formica, (*cont.*).	2. Fuliginosa.	34	221. Harelda	Glacialis.	274
	3. Fusca.	31	222. Helix	Aspersa.	732
	4. Indefessa.	27	223. Herpestes	1. Griseus.	477
	5. Ligniperda.	40		2. Ichneumon.	416
	6. Nigra.	32	224. Herpetotheres	1. Cachinnans.	285
	7. Pratensis.	39		2. Ponticerianus.	286
	8. Pubescens.	38	225. Heterolocha	1. Acutirostris.	409
	9. Quadriceps.	37		2. Gouldi.	410
	10. Rufa.	29	226. Hieracidea	Brunnea.	394
	11. Rufescens.	35	227. Hippobosca	Equinia.	310
	12. Rufibarbis.	33	228. Hippocampus	Brevirostris.	702
	13. Sanguinea.	36	229. Hippopotamus	Amphibius.	403
189. Fratercula	Arctica.	656	230. Hirundo	1. Ariel.	488
190. Fregilus	Graculus.	232		2. Cahirica.	789
191. Fringilla	1. Canaria.	169		3. Capensis.	786
	2. Cannabina.	678		4. Domestica.	790
	3. Chloris.	363		5. Frontalis.	787
	4. Citrinella.	194		6. Fulva.	788
	5. Cœlebs.	186		7. Purpurea.	486
	6. Montifringilla.	142		8. Riparia.	487
	7. Rufescens.	677		9. Rustica.	785
192. Furnarius	Fuliginosus.	580		10. Urbica.	485
193. Galeodes	Intrepida.	763	231. Homarus	Vulgaris.	459
194. Galictes	Vittata.	365	232. Hyæna	1. Crocuta.	414
195. Gallicrex	Cristatus.	327		2. Striata.	413
196. Gallinula	Chloropus.	326	233. Hydrochœrus	Capybara.	170

197. Gallus	1. Domesticus.	319
	2. Stanleyi.	320
198. Garrulus	1. Canadensis.	489
	2. Cristatus.	423
	3. Glandarius.	422
199. Gasterosteus	1. Leiurus.	780
	2. Trachurus.	781
200. Gecarcinus	Ruricola.	215
201. Geomys	Bursarius.	670
202. Geotrupes	1. Stercorarius.	101
	2. Vernalis.	97
203. Gerygone	Flaviventris.	860
204. Glaucopis	1. Cinerea.	233
	2. Wilsoni.	234
205. Glossina	Morsitans.	826
206. Gracula	Indica.	356
207. Grus	Cinerea.	219
208. Gryllus	Viridissimus.	358
209. Gulo	Luscus.	338
210. Gymnotus	Electricus.	290
211. Gyps	Nivicola.	849
212. Gyphïetus	Barbatus.	438
213. Hæmatopus	1. Longirostris.	592
	2. Ostrealegus.	591
214. Hæmopis	Sanguisorba.	445
215. Halcyon	1. Sanctus.	431
	2. Vagans.	432
216. Haliïetus	1. Albicilla.	283
	2. Leucocephalus.	284
217. Halicore	Indica.	280
218. Haltica	Oleracea.	111
219. Hapale	1. Jacchus.	517
	2. Penicillata.	516
220. Hapalotis	Albipes.	385
234. Hyla	Arborea.	323
235. Hylobates	1. Agilis.	333
	2. Hoolook.	334
	3. Lar.	332
	4. Leuciscus.	335
	5. Syndactylus.	336
236. Hymenolæmas	Malacorynchus.	278
237. Hyrax	Syriacus.	204
238. Hystrix	Cristata.	649
239. Icterus	1. Baltimorii.	571
	2. Pecoris.	573
	3. Spurius.	572
240. Indicator	Sparmanni.	404
241. Indris	Brevicaudatus.	417
242. Labrus	Variegatus.	905
243. Lagomys	1. Alpinus.	389
	2. Glacialis.	387
	3. Ogotono.	390
	4. Pusillus.	388
244. Lagopus	1. Scoticus.	366
	2. Vulgaris.	655
245. Lagostomys	Viscacia.	839
246. Lagothrix	Humboldti.	518
247. Lampyris	Noctiluca.	904
248. Lanius	1. Collaris.	719
	2. Excubitor.	160
	3. Septentrionalis.	161
249. Larus	1. Argentatus.	376
	2. Bulleri.	378
	3. Canus.	382
	4. Dominicanus.	379
	5. Fuscus.	381
	6. Marinus.	380
	7. Parasiticus.	383

ENUMERATION OF GENERA—*continued*.

Genera	Species	References to Catalogue I. (of Species)	Genera	Species	References to Catalogue I. (of Species)
249. Larus, (*cont.*)	8. Scopulinus.	377	283. Martes, (*cont.*)	3. Foina.	483
250. Lathrus	Cephalotes.	113	284. Megachile	Centuncularis.	93
251. Lemur	1. Albifrons.	450	285. Megaloperdix	Tibetanus.	612
	2. Catta.	449	286. Megalopterus	Stolidus.	559
	3. Macaco.	448	287. Megapodius	Tumulus.	426
	4. Mongoz.	469	288. Melanerpes.	Formicivorus.	891
252. Lepas	Anatifera.	75	289. Melanocorypha	Calandra.	443
253. Lepidopus	Caudatus.	324	290. Meleagris	1. Gallopavo.	828
254. Leptorhynchus	Angustatus.	116		2. Ocellata.	829
255. Lepus	1. Artemisius.	664	291. Meles	Taxus.	74
	2. Cuniculus.	662	292. Mellivora	Capensis.	673
	3. Timidus.	386	293. Meminna	Indica.	491
	4. Sylvaticus.	663	294. Menura	1. Alberti.	468
256. Libellula	Depressa.	266		2. Superba.	467
257. Limax	1. Arborum.	730	295. Mephitis	Americana.	727
	2. Ater.	729	296. Mergus	Serrator.	493
258. Linaria	Linota.	452	297. Merula	1. Minor.	494
259. Liparis	Chrysorrhœa.	540		2. Vulgaris.	125
260. Lithobius	Forficatus.	182	298. Microptura	Americana.	884
261. Locustella	Nævia.	861	299. Midas	1. Argentatus.	537
262. Loligo	1. Media.	766		2. Rosalia.	530
	2. Vulgaris.	767	300. Milvus	Govinda.	434
263. Lomechusa	Strumosa.	110	301. Mimus	1. Carolinensis.	178
264. Lophius	Piscatorius.	12		2. Polyglottus.	495
265. Lophophorus	Impeyanus.	631	302. Miopithecus	Talapoin.	509
266. Loris	1. Gracilis.	462	303. Miro	1. Albifrons.	689

266. Loris, (*cont.*)
267. Loxia.
268. Lucanus
269. Lumbricus.
270. Lutra.
271. Lycosa
272. Lynx.
273. Lyriocephalus
274. Macacus
275. Machetes.
276. Macropodus
277. Macropus.
278. Macrorhinus
279. Macroscelides
280. Malapterurus
281. Manatus
282. Mantis
283. Martes

2. Tardigradus. 461
1. Curvirostra. 224
2. Leucoptera.
3. Socia. 226
Cervus. 104
1. Gigas. 902
2. Terrestris. 901
1. Canadensis. 577
2. Marina. 578
3. Vulgaris. 576
Armentata. 762
1. Canadensis. 465
2. Rufus. 466
3. Virgatus. 464
Scutatus. 457
1. Assamensis. 533
2. Cynomolgus. 531
3. Nemestrinus. 534
4. Radiatus. 511
5. Rhesus. 510
6. Silenus. 532
Pugnax. 692
Pugnax. 307
1. Giganteus. 428
2. Penicillatus. 852
Proboscideus. 706
Rozeti. 718
Electricus. 291
Australis. 475
1. Oratoria. 654
2. Precaria. 653
3. Religiosa. 652
1. Abietum. 484
2. Canadensis. 619

304. Molobrus
305. Monachus
306. Monedula
307. Monitor
308. Monodon
309. Morrhua
310. Moschus
311. Motacilla
312. Mugil
313. Muræna
314. Mus
315. Musca
316. Muscardinus
317. Muscicapa
318. Mustela
319. Mustelus
320. Mycetes
321. Mygale
322. Myiomora
323. Myodes

2. Longipes. 688
Pecoris. 210
Albiventer. 704
Surinamensis. 867
Niloticus. 456
Monoceros. 555
Vulgaris. 201
Moschiferus. 551
1. Boarula. 851
2. Yarrellii. 850
Chelo. 550
Syren. 288
1. Decumanus. 668
2. Giganteus. 669
3. Musculus. 546
4. Rattus. 667
5. Sylvaticus. 547
1. Carnaria. 309
2. Domestica. 308
Avellanarius. 262
1. Atricapilla. 313
2. Griseola. 314
1. Erminea. 297
2. Furo. 304
3. Putoria. 648
4. Vison. 840
5. Vulgaris. 869
Lævis. 260
1. Albifrons. 527
2. Cavaya. 536
3. Ursinus. 526
Cœmentaria. 759
Toitoi. 810
1. Lemmus. 446

ENUMERATION OF GENERA—*continued*.

Genera	Species.	References to Catalogue I. (of Species)
323. Myodes, (*cont.*)	2. Torquatus.	417
324. Myrmecocystus	Mexicanus.	23
325. Myrmecophaga	Jubata.	53
326. Myrmeleon.	Formicarium.	54
327. Myrmica	1. Erythrothorax.	44
	2. Molefaciens.	20
	3. Paleata.	43
	4. Ruginodis.	46
	5. Rubra.	45
328. Naja	1. Haje.	65
	2. Tripudians.	733
329. Nasua.	Fusca.	643
330. Naucrates	Ductor.	640
331. Nauterna	Pygmæa.	605
332. Necrophorus	Vespillo.	100
333. Nemesia	Eleanora.	760
334. Neophron	Pecnopterus.	848
335. Nestor	1. Meridionalis.	427
	2. Notabilis.	429
	3. Productus.	606
336. Noctua	Ewingii.	545
337. Nucifraga	Caryocatactes.	560
338. Numida	Cornuta.	374
339. Nycticorax.	1. Gardeni.	399
	2. Griseus.	400
340. Nyctipithecus	Trivirgatus.	525
362. Padda	Oryzivora.	748
363. Pagurus	1. Bernhardus.	212
	2. Prideauxii.	213
364. Palæornis	Alexandri.	595
365. Paradisea	1. Apoda.	594
	2. Papuana.	593
366. Parra	Jacana.	418
367. Parus	1. Bicolor.	880
	2. Cæruleus.	812
	3. Cristatus.	814
	4. Major.	813
368. Passer	1. Domesticus.	744
	2. Montanus.	745
	3. Stultus.	746
369. Passerita	Nycterizans.	736
370. Pavo	Cristatus.	616
371. Pelecanus	1. Bassanus.	133
	2. Erythrorynchus.	621
	3. Onocrotalus.	620
372. Penelope	1. Crista'a.	372
	2. Nigra.	239
373. Pentatoma	Punicea.	148
374. Perdix	Cinerea.	611
375. Phalacrocorax	1. Carbo.	206
	2. Cristatus.	208
	3. Graculus	709

341. Octodon . . . Degus. 564
342. Octopus . . . Vulgaris. 565
343. Ocydromus . . 1. Australis. 886
2. Earli. 887
3. Fuscus. 885
344. Œcophylla . . . Smaragdina. 48
345. Œdicnemus . . Crepitans. 241
346. Œstrus . . . 1. Bovis. 136
2. Equi. 135
3. Ovis. 137
4. Tarandi. 138
347. Oidemia . . . 1. Fusca. 277
2. Nigra. 276
348. Ophiocoma . . . 1. Neglecta. 773
2. Rosula. 774
349. Orca . . . . Gladiator. 357
350. Oriolus . . . Galbula. 570
351. Ornithorynchus . . Paradoxus. 279
352. Orthonyx . . . Albicilla. 881
353. Ortygornis . . Gularis. 615
354. Ortyx . . . . Virginiana. 661
355. Orycteropus . . Capensis. 52
356. Osmerus . . . Viridescens. 731
357. Osmia . . . . Bicolor. 92
358. Otaria . . . . 1. Leonina. 700
2. Stelleri. 701
3. Ursina. 699
359. Otis . . . . 1. Nigriceps. 159
2. Tarda. 158
360. Ovibos . . . Moschatus. 552
361. Ovis . . . . 1. Argali. 714
2. Aries. 712
3. Burrhel. 715
4. Tragelaphus. 713

376. Phascolarctos . . Cinereus. 436
377. Phascolomys . . Wombata. 900
378. Phasianus . . . 1. Argus. 629
2. Colchicus. 627
3. Pictus. 628
379. Pheidole . . . 1. Pabulator. 41
2. Plagiaria. 42
380. Philomela . . . Luscinia. 558
381. Philodryas . . . Viridissimus. 741
382. Phoca . . . . Vitulina. 703
383. Phocæna . . . 1 Communis. 650
2. Globiceps. 875
384. Phœnicopterus . . 1. Americanus. 305
2. Chilensis.
385. Phyllostoma . . Spectrum. 834
386. Pica . . . . Caudata. 471
387. Picus . . . . 1. Familiaris. 890
2. Principalis. 889
3. Viridis. 888
388. Pieris . . . . Rapæ. 162
389. Pinnotheres . . 1. Pisum. 216
2. Veterum. 217
390. Pipra . . . . Deliciosa. 474
391. Pithecia . . . 1. Melanocephala. 524
2. Satanas. 522
3. Sugulata. 523
392. Pitta . . . . Brachyura. 644
393. Platycercus . . 1. Auriceps. 597
2. Novæ Zelandiæ. 596
394. Ploceus . . . 1. Abyssinicus. 749
2. Philippinus. 870
3. Socius. 871
4. Punctatus. 708
5. Sinensis. 207

ENUMERATION OF GENERA—*continued*.

Genera	Species	References to Catalogue I. (of Species)
395. Podargus	Humeralis.	647
396. Podiceps	1. Cristatus.	361
	2. Minor.	360
397. Polistes	1. Carnifex.	865
	2. Gallica.	864
398. Pomphilus	Polistoides.	866
399. Prion	Turtur.	626
400. Procyon	Lotor.	665
401. Prosthemadera	Novæ Zelandiæ.	827
402. Pseudomyrma	Bicolor.	24
403. Psophia	Crepitans.	2
404. Psittacus	1. Amazonicus.	601
	2. Ararauna.	602
	3. Carolinensis.	600
	4. Erythacus.	598
	5. Pertinax.	599
405. Ptilonorynchus	Holosericeus.	140
406. Pulex	Irritans.	306
407. Pycnonotus	Hæmorrhous.	149
408. Pyrgita	1. Melanura.	753
	2. Montana.	751
	3. Salicicola.	752
409. Pyrrhula	1. Canadensis.	152
	2. Vulgaris.	151
410. Raia	1. Clavata.	725
	2. Maculata.	726
434. Scolopax, (*cont.*)	3. Wilsoni.	743
435. Scolopendra	Morsitans.	183
436. Scomber	Vernalis.	470
437. Scorpio	Europæus.	698
438. Selasphorus	Platycercus.	412
439. Semipodius	Pugnax.	660
440. Semnopithecus	1. Entellus.	504
	2. Leucoprymnus.	505
	3. Mitratus.	506
	4. Nemæus.	503
441. Sepia	Officinalis.	242
442. Sepiola	Rondeletii.	707
443. Sericulus	Melinus.	680
444. Serrasalmo	Piraya.	642
445. Silurus	Glanis.	722
446. Simia	1. Abelii.	568
	2. Satyrus.	567
	3. Sylvanus.	59
	4. Wurmbii.	569
447. Sitta	Europæa.	561
448. Solenopsis	Laboriosa.	47
449. Spalax	Typhlus.	671
450. Sparus	Indicator.	64
451. Spermophila	Olivacea.	359
452. Spheniscus	Humboldti.	624
453. Sphinx	Convolvuli.	542

411. Rallus	Philippensis.	666
412. Ramphocœlus	Passerinii.	799
413. Ramphostos	Toco.	821
414. Rana	1. Esculenta.	322
	2. Temporaria.	321
415. Ranatra	Linearis.	147
416. Regulus	Cristatus.	908
417. Rhinoceros	1. Africanus.	683
	2. Indicus.	682
418. Rhipidura	Flabellifera.	302
419. Rubecula	Familiaris.	687
420. Rupicola	Elegans.	197
421. Ruticilla	Phœnicura.	679
422. Saimuris	Entomophagus.	84
423. Salamandra	Atra.	694
424. Salmo	1. Fario.	825
	2. Salar.	695
425. Salticus	Scenicus.	757
426. Sanguisuga	Medicinalis.	444
427. Sarcoramphus	Gryphus.	203
428. Saturnia	Pavonia.	539
429. Saurothera	Vetula.	796
430. Saxicola	1. Isabellina.	782
	2. Œnanthe.	876
	3. Rubetra.	878
431. Scarabæus	1. Carnifex.	98
	2. Sacer.	102
432. Sceloglaux	Albifacies.	589
433. Sciurus	1. Carolinensis.	770
	2. Hudsonius.	770
	3. Leucotis.	772
	4. Vulgaris	769
434. Scolopax	1. Gallinago.	742
	2. Rusticola.	883
454. Spio	Seticornis.	765
455. Squatina	Angelus.	11
456. Sterna	Hirundo.	802
457. Strepsilas	Interpres.	830
458. Stringops	Habroptilus.	607
459. Strix	1. Brachyotus.	582
	2. Flammea.	581
	3. Otus.	584
	4. Ulula.	583
460. Struthio	Camelus.	575
461. Sturnella	Ludoviciana.	779
462. Sturnus	1. Curæus.	778
	2. Vulgaris.	777
463. Sula	1. Fusca.	134
	2. Serrator.	328
464. Sus	Scrofa.	132
465. Sygnathus	Acus.	641
466. Sylvia	1. Arundinacea.	856
	2. Atricapilla.	127
	3. Cinerea.	858
	4. Phragmites.	855
	5. Rufa.	882
	6. Sutoria.	797
	7. Trochilus.	857
467. Sylvicola	Æstiva.	859
468. Tabanus	Bovinus.	325
469. Tachornis	Phœnicobæa.	795
470. Tadorna	Vulpanser.	716
471. Talegalla	Lathami.	798
472. Talpa	Europæa.	496
473. Tanager	Mexicana.	406
474. Tapinoma	Glabrata.	26
475. Tapirus	1. Americanus.	800
	2. Indicus.	801

ENUMERATION OF GENERA—*continued.*

Genera	Species	References to Catalogue I. (of Species)	Genera	Species	References to Catalogue I. (of Species)
476. Termes	1. Arborum.	49	495. Turtur	1. Communis.	264
	2. Bellicosus.	50		2. Risorius.	265
	3. Lucifugus.	51	496. Tyrannus	1. Carolinensis.	832
477. Testudo	Græca.	818		2. Intrepidus.	833
478. Tetrao	1. Canadensis.	368	497. Upupa	Epos.	405
	2. Cupido.	367	498. Uraster	Glacialis.	775
	3. Phasaniellus.	370	499. Uria	Troile.	373
	4. Tetrix.	128	500. Ursus	1. Americanus.	79
	5. Umbellus.	369		2. Arctos.	77
	6. Urogallus.	170		3. Ferox.	80
479. Textor	Erythrorhynchus.	872		4. Labiatus.	83
480. Thecla	Isocrates.	164		5. Malayanus.	82
481. Toxotes	Jaculator.	63		6. Maritimus.	78
482. Tragopan	Satyrus.	630		7. Syriacus.	81
483. Tragulus	Javanicus.	554	501. Vanellus	Cristatus.	439
484. Trichecus	Rosmarus.	853	502. Vanga	Curvirostris.	720
485. Trichoglossus	Swainsoni.	610	503. Vespa	1. Crabro.	407
486. Tringa	1. Hypoleucos.	696		2. Germanica.	863
	2. Maritima.	697		3. Vulgaris.	862
487. Triton	1. Cristatus.	557	504. Vidua	Paradisea.	877
	2. Punctatus.	556	505. Vipera	Communis.	837
488. Trochilus	Colubris.	409	506. Viro	Solitarius.	838
489. Troglodytes (Ape)	1. Calvus.	189	507. Viverra	1. Civetta.	195
	2. Gorilla.	355		2. Genetta.	331
	3. Niger.	188		3. Socialis.	196
	4. Schweinfurthii.	190		4. Suricata.	784

490. Troglodytes (Bird) .	1. Ædon.	901	508. Vorticella . . .		Nebulifera.	120
	2. Parvulus.	906	509. Vulpes . . .		1. Lagopus.	317
491. Trogon . . .	1. Atricollis.	823			2. Magellanicus.	316
	2. Caligatus.	824			3. Vulgaris.	315
	3. Massena.	822			4. Zerda.	303
492. Turdus . . .	1. Felivox.	806	510. Vultur . . .		Fulvus.	844
	2. Migratorius.	805	511. Yunx . . .		Torquilla.	909
	3. Musicus.	804	512. Xerobates . . .		Polyphemus.	820
	4. Viscivorus.	803	513. Xylocope . . .		Violacea.	90
493. Turnagra . . .	1. Crassirostris.	808	514. Zonotrichia . .		Melodia.	747
	2. Hectori.	807	515. Zooteca . . .		Vivipara.	454
494. Turnix . . .	Taijoor.	396	516. Zosterops . . .		Lateralis.	723

SUMMARY.

Number of Genera represented	516
„ Species „	908

III. Enumeration of Sub-Kingdoms, Classes, and Orders represented.

Arrangement in a natural or ascending series. The Genera, however, are arranged alphabetically.

Sub-Kingdoms, Classes, and Orders	Genera	References to Enumeration II. of Genera and Species.
Sub-Kingdom I. Protozoa.		
Class I. Rhizopoda.		
Order Amœbœa . .	1. Amœba.	15
	2. Actinophrys.	9
Cl. II. Infusoria . .	Vorticella.	508
Sub-King. II. Cœlenterata [or Radiata].		
Cl. I. Hydrozoa. . .	Aurelia.	46
— II. Actinozoa . .	1. Actinia.	8
	2. Adamsia.	10
Sub-King. III. Annuloida.		
Cl. I. Echinodermata.		
Ord. I. Crinoidea . .	Comatula.	132
— II. Asteroidea .	Uraster.	498
— III. Ophiuroidea .	Ophiocoma.	348
Cl. II. Scolecida . .	Acephalocystis.	5
Sub-King. IV. Annulosa.		
Div. I. Anarthropoda.		
Cl. Annelida.		
Ord I. Hirudinea .	1. Hirudo.	
	2. Hæmopis.	214
	3. Sanguisuga.	426
Sub-King. IV. Annulosa (*con.*)		
Ord. I. Hemiptera .	5. Pentatoma.	373
	6. Ranatra.	415
Ord. II. Orthoptera .	1. Acheta.	7
	2. Acrida.	
	3. Blatta.	53
	4. Forficula.	187
	5. Gryllus.	208
	6. Locusta.	
	7. Mantis.	282
Ord. III. Neuroptera	1. Chrysopa.	114
	2. Libellula.	256
	3. Myrmeleon.	326
	4. Termes.	476
Sub-Cl. II. Holo-metabola.		
Ord. I. Aphaniptera	Pulex.	406
Ord. II. Diptera .	1. Culex.	148
	2. Glossina.	205
	3. Hippobosca.	227
	4. Musca.	315
	5. Œstrus.	346

Ord. II. Oligochæta .	Lumbricus.	269
— III. Tubicola .	Spio.	454
Div. II. Arthropoda [or Articulata].		
Cl. I. Crustacea.		
Sub-Cl. I. Cirripedia .	Lepas.	252
— II. Malacostraca		
Ord. Decapoda. .	1. Birgus.	52
	2. Carcinus.	82
	3. Crangon.	138
	4. Gecarcinus.	200
	5. Homarus.	231
	6. Pagurus.	363
	7. Pinnotheres.	389
Cl. II. Arachnida . .	1. Aranea.	35
	2. Atypus.	44
	3. Calliethera.	73
	4. Cteniza.	145
	5. Epeira.	175
	6. Galeodes.	193
	7. Lycosa.	271
	8. Mygale.	321
	9. Nemesia.	333
	10. Salticus.	425
	11. Scorpio.	437
Cl. III. Myriapoda . .	1. Lithobius.	260
	2. Scolopendra.	435
— IV. Insecta.		
Sub-Cl. I. Hemi-metabola.		
Ord. I. Hemiptera .	1. Aphis.	27
	2. Cicada.	115
	3. Cimex.	118
	4. Coccus.	126
	6. Tabanus.	468
Ord. III. Lepidoptera, including their caterpillars	1. Acherontia.	6
	2. Aporia.	29
	3. Aptura.	32
	4. Cnethocampa.	123
	5. Cucullia.	146
	6. Liparis.	259
	7. Noctua.	336
	8. Pieris.	388
	9. Saturnia.	428
	10. Sphinx.	453
	11. Thecla.	480
Ord. IV. Hymenoptera.	1. Anthocapa.	22
	2. Apis.	28
	3. Atta.	43
	4. Bombus.	56
	5. Eciton.	169
	6. Formica.	188
	7. Megachile.	284
	8. Monedula.	306
	9. Myrmecocystus.	324
	10. Myrmica.	327
	11. Œcophylla.	344
	12. Osmia.	357
	13. Pheidole.	379
	14. Polistes.	397
	15. Pomphilus.	398
	16. Pseudomyrma.	402
	17. Solenopsis.	448
	18. Tapinoma.	474
	19. Vespa.	503
	20. Xylocope.	513
Ord. V. Coleoptera.	1. Anobium.	20
	2. Ateuchus.	41

ENUMERATION OF SUB-KINGDOMS, CLASSES, AND ORDERS—*continued*.

Sub-Kingdoms, Classes, and Orders.	Genera	References to Enumeration II. of Genera and Species
Sub-King. IV. Annulosa (*con.*)		
Ord. V. Coleoptera	3. Bromius.	62
	4. Carabus.	80
	5. Cetonia.	101
	6. Cicindela.	116
	7. Chiasognathus.	108
	8. Claviger.	121
	9. Coccinella.	124
	10. Colnocera.	131
	11. Geotrupes.	202
	12. Haltica.	218
	13. Lampyris.	247
	14. Lathrus.	250
	15. Leptorynchus.	254
	16. Lomechusa.	263
	17. Lucanus.	268
	18. Necrophorus.	332
	19. Scarabæus.	431
Sub-King. V. Mollusca.		
Div. I. Molluscoida.		
Cl. Polyzoa	Bowerbankia.	60
Div. II. Mollusca proper.		
Cl. I. Gasteropoda	1. Helix.	222
	2. Limax.	257
— II. Cephalopoda	1. Eledone.	171
	2. Loligo.	262
Sub-King. VI. Vertebrata (*con.*)		
Cl. I. Pisces	1. Hippocampus.	228
	2. Sygnathus.	465
Sub-Ord. IV. Lophobranchii.		
Ord. II. Elasmobranchii	Chimæra.	109
Sub-Ord. I. Holocephali	1. Acanthias.	1
— II. Plagiostomi	2. Carcharias.	81
	3. Mustelus.	319
	4. Raia.	410
	5. Squatina.	455
Cl. II. Amphibia [or Batrachia].		
Ord. I. Urodela	1. Salamandra.	428
	2. Triton.	487
— II. Anoura	1. Bufo.	65
	2. Hyla.	234
	3. Rana.	414
Cl. III. Reptilia.		
Ord. I. Chelonia	1. Chelonia.	107
	2. Emys.	174
	3. Testudo.	477
	4. Xerobates.	512
Ord. II. Ophidia	1. Boa.	55
	2. Bucephalus.	64
	3. Coluber.	127
	4. Naja.	328

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GENERAL ANALYTICAL INDEX.

MUCH experience of books, especially of such as abound both in facts and inferences, has led me to regard a full general index as one of their most important features or one of their greatest wants. Such an index offers the means whereby the reader who has little time or inclination to peruse the whole of a bulky volume, or of a series of volumes, may, almost at a glance, satisfy himself of the general scope or aim of any given work, or may guide himself to any section of it that may exclusively have an interest for him.

Such an index is, I think, especially necessary in a work which must be regarded as the condensation of four or five volumes into two, and which contains, as one of the results of selection of material, numerous references, scattered throughout its pages, to subjects that, for reasons specified in the introduction to the first volume, cannot be treated otherwise than by passing mention. And yet these references are necessary to the completeness of the catalogue of the mental endowments of animals—necessary to a general view of the subject of 'Mind in the Lower Animals.'

There is every probability, moreover, that the present work will be read by persons of the most opposite habits of thought and life; by physicians and metaphysicians, by travellers and naturalists, by sportsmen and veterinarians, by theologians and moral philosophers, and by critics of all kinds, as well as by members of that unlimited heterogeneous class, the general public, each of them being interested in some particular department of the general subject. To students so various in their views and requirements a full general index will,

it is hoped, afford the means of discovering at once what are the sections or chapters to them of greatest interest.

I have, therefore, devoted several months to the compilation of the following copious index to the general or special topics discussed or referred to in the two volumes of which this work consists, and of which work I regard it as an essential feature.

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